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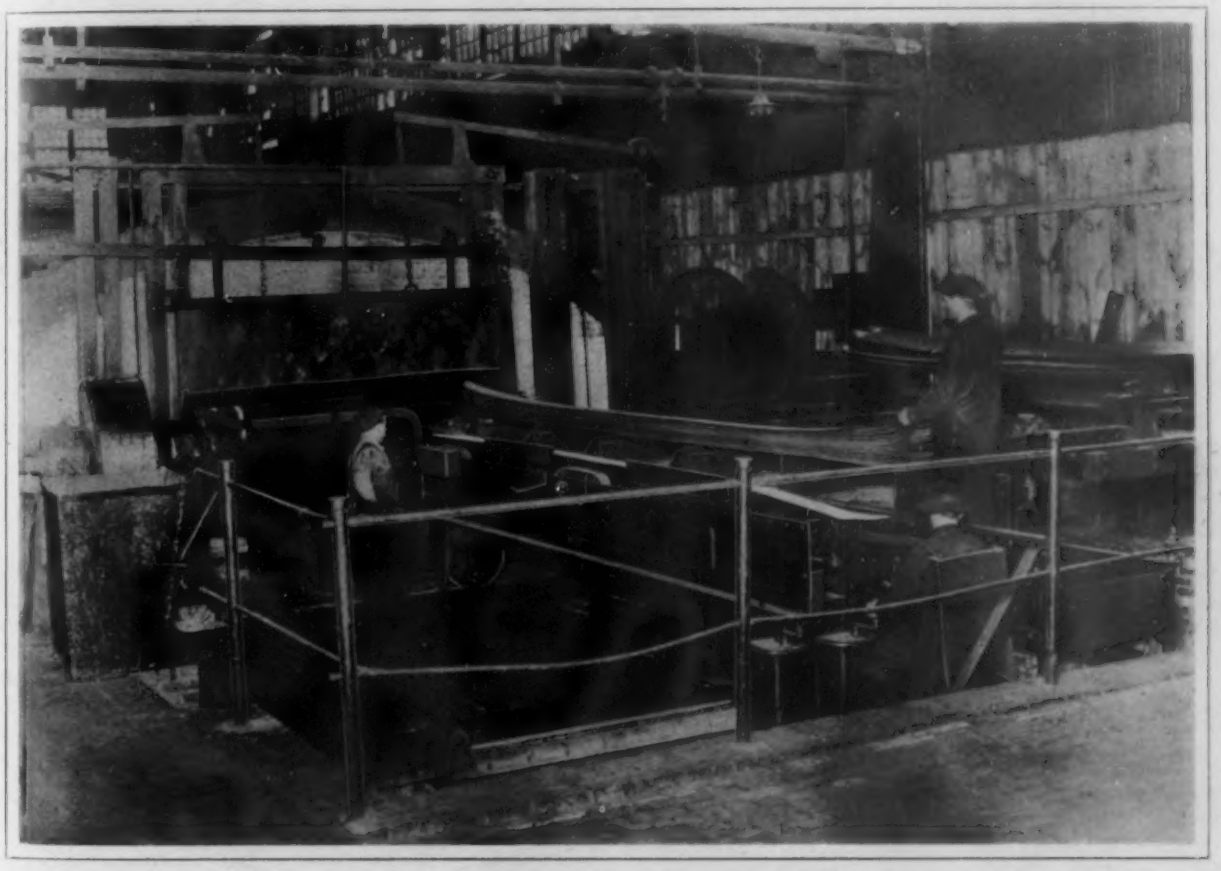
Magnetic Skelp Charging Machine

Feeding Rolls Magnetized Propel the Plates into the Heating Furnace—Machine May Travel Across the Front of the Furnace

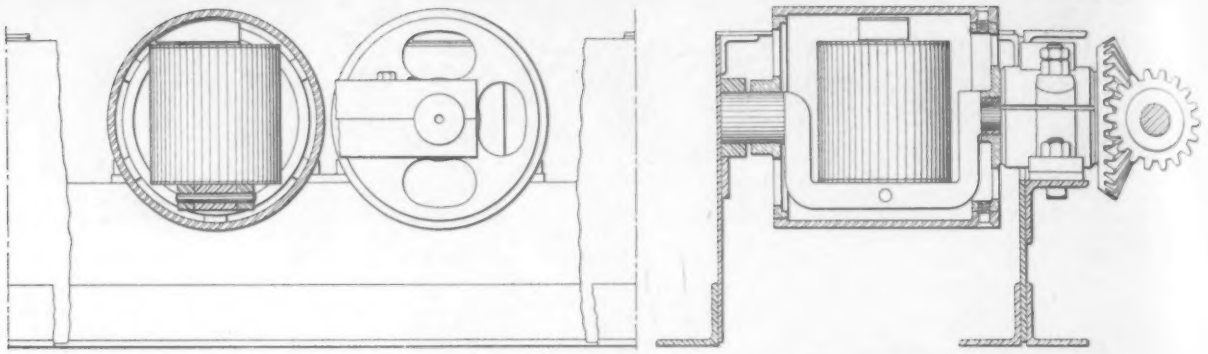
A machine for charging into the heating furnace the plates or skelp from which pipe is made has been developed by the Taylor-Wilson Mfg. Company, McKees Rocks, Pa., a company which has made a specialty of machinery for iron and steel pipe making. The machine, with a frame of plates and angles, mounted on four wheels, has two motors, one for the travel of the machine across the front of the furnace and the other, a variable speed motor, to drive the charging rolls. The top of the machine is made to carry a pile of the plates to be charged, and parallel with the piled plates is a trough or table slightly higher than the furnace door. Located near each end of this trough is a pair of rolls. Placed inside of these rolls are stationary magnets. The object of the magnets is to attract the plate to the rolls and thus produce sufficient friction to propel the plates. The rolls are made of manganese steel to minimize wear and also to avoid a permanently magnetized roll. The rolls are driven at a speed suitable to the size of plates being charged.

The machine is designed to charge all sizes of plates required for making pipe by the method known as butt welding, which sizes cover pipe ⅛ to 4 in. in diameter. The plates are about 20 ft. long.



The Man Standing on the Machine, Which Travels Across the Furnace, Throws Each Plate into the Trough Where Magnetized Rolls Grip the Plate Sufficiently to Propel It Into the Furnace

The usual method of charging is by hand. The end of the plate is placed in the furnace door and the man or men holding the other end run forward and push the plate into the furnace. The plate is then adjusted by a second man. Owing to the high temperature from the open end or door of the furnace, this work is hard and the men must be relayed every 40 min. More or less skill is also required. In making ¾-in. pipe 8000 to 9000 pieces



Sections Through the Rolls of the Magnetic Skelp Charging Machine Showing the Stationary Magnets

of plate must be charged in an 11-hr. turn. This fact gives some idea of the amount of material handled.

The accompanying reproduction of a photograph shows the method of charging with the magnetic charging machine. The plate being propelled from both ends is kept straight and is delivered into the furnace, as expected, in a much more regular manner than by hand charging. When the proper speed is obtained for the rolls they are run continuously and the plates are therefore delivered in the furnace at a regular distance from the door.

In operating only two men are necessary on the machine proper. One operates the motors and the other throws the plates from the pile to the charging trough. When the rolls are run continuously, a set of arms which extend above the rolls are made part of the machine to prevent the plates being charged when placed in position. The plate rests on these and when it is desired to charge it, a lever lowers the arms and brings the plate in contact with the rolls.

The advantages of the machine are enumerated as follows: 1. It is more economical than hand charging as 3 to 4 men can be eliminated. 2. The material is charged in a more regular manner and more plates can be placed across the furnace due to this regularity in charging. 3. As the men do not approach the furnace, the work is not so exhausting as when done by hand. 4. Less skilled help suffices. 5. Owing to the rapidity with which the machine charges, the men operating the machine are not constantly working, as the speed of the machine is greater than that of the furnace to heat.

The machine, it is understood, is in operation in several of the pipe mills of the United States and Canada. The Taylor-Wilson Mfg. Company has patented the machine in the United States and foreign countries.

Small Self-Contained Planing Machine

A new type of motor-driven planing machine which is particularly adapted for trade schools and technical institutions has been placed on the market by the Cincinnati Planer Company, Cincinnati, Ohio. It is entirely self-contained and the wiring is carried in conduit with the starting box attached to the top plate. Among the work that this machine is particularly adapted to handle is the making of small duplicate manufacturing parts as well as the ordinary run of planing machine work.

The bed is bored for the driving shaft bearings which are internally ground. Self-oiling bronze bushings are provided for the loose pulleys and both the horizontal and vertical feeds have micrometer collars. Crank handles have been done away with and fixed ones substituted. A new design of feed gear in which the old style flat spring and pawl have been eliminated has been placed at the end of the rail. One of the features of the gear is that nothing but the operating handle is exposed. The practice of covering the gears thoroughly to eliminate chances of accidents to the operator has been followed throughout the machine.

The upper driving shaft revolves in bearings that are provided with bronze bushings and ring-

A Recently Developed Small Self-Contained Planing Machine for Trade and Technical Schools

oiling devices. These bearings are fastened to the top plate which carries the motor and the starting box, thus making a complete unit of them. The starting box is mounted at the extreme end of this plate away from the belts which it is pointed out eliminates the dangerous practice of reaching through the belt openings to start the machine, which is the case when the starting box is mounted on the side of the housings.

The H. L. Brown Fence & Mfg. Company, manufacturer of ornamental woven wire lawn fence, etc., is one of the busiest of the factory colony at Oakley, a thriving manufacturing suburb of Cincinnati, Ohio. Its plant is running full time. Its faith in good business for the coming season is shown in its employment of a special engineer to design improved machinery in the expectation of turning out lawn fence the best in quality and most attractive in appearance. The company also makes tree guards, flower bed borders and other artistic designs for the lawn. Quality is the watchword in the factory, the motto in the office and slogan of the salesmen. The company's output is handled through the hardware jobbers. It is in position to take good care of its business, having a private railroad siding for receiving and shipping.

CARWHEEL GRINDING MACHINE

A Self-Contained Unit for Steel or Chilled Wheels with a Single-Belt Drive

For grinding steel or chilled cast-iron wheels on their axles the Springfield Machine Company, Bridgeport, Conn., has developed a self-contained carwheel grinding machine. Wheels ranging from 28 to 44 in. in diameter can be handled, and the grinding or truing of a pair of wheels can be done on their own axle if desired or on dead centers. A single belt from the main lineshaft or a motor drives the machine, which is arranged so that a crane can pass over it for placing or removing the wheel without interference.

A clutch which can be operated by hand levers from either side of the machine enables the axle to be stopped instantly when the opening or gap in the gear is directed toward the top to permit the removal of the axle. A common shaft is used to drive the pinions that operate the machine. This arrangement is relied upon to insure the same relative position at all times and to overlap the gap in the driven gear. Three different speeds for the rotation of the axles are available.

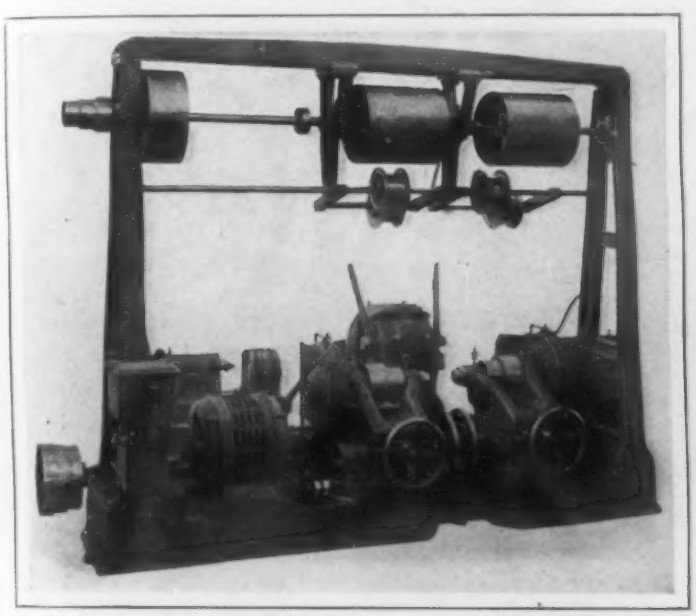
The headstocks of the machine can be swiveled to permit tapers to be ground and the tailstocks are of heavy construction with large sleeves and feed screws. The journal rests are arranged to receive different sizes of half shells and are adjustable for small differences in the diameter of the journals.

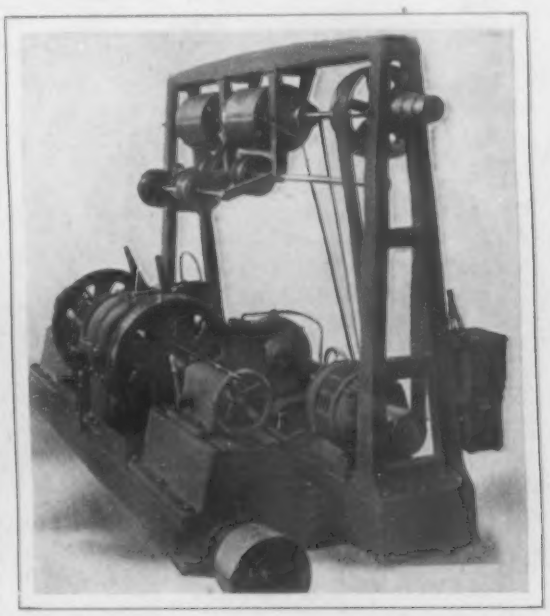
The grinding wheel spindles are driven by a belt from overhead drums and automatic belt tightening idlers are relied upon to maintain the proper tension at all times. The travel of the grinding wheel heads parallel with the axle and the feed are accomplished by hand. The feed screws, which are large, have long nuts and ball bearings to take up end thrust are provided. The cone pulley driving the spindle provides two different speeds for the wheel. The grinding wheel spindles are made of high carbon steel and run in bronze bearings. The slide bearings are narrow and long, with adjustable taper gibs to take care of wear.

The equipment furnished with the machine includes a pump for supplying water to the grinding wheels and a set of wrenches. The water supply is taken from a tank in a portion of the bed and hoods over the wheels prevent the spray from falling on the floor.

The following table gives the principal dimensions and specifications of the machine:

Minimum diameter of wheel ground, in.	28
Maximum diameter of wheel ground, in.	44
Gauge of wheels, in.	56½
Maximum diameter of journal taken, in.	6
Maximum length of axle taken, in.	94
Diameter of grinding wheels, in.	18
Face width of grinding wheels, in.	2½
Diameter of driving drum, in.	18
Length of driving drum, in.	20
Approximate speed of driving drum, r.p.m.	520
Diameter of smaller grinding wheel cone pulley step, in.	7
Diameter of larger grinding wheel cone pulley step, in.	9
Face width of grinding wheel cone pulley steps, in.	4½
Maximum speed of grinding wheels, r.p.m.	1,350
Minimum speed of grinding wheels, r.p.m.	1,010
Maximum speed of driving wheel gear, r.p.m.	6.5
Minimum speed of axle driving gear, r.p.m.	4.2
Number of speed changes	3
Diameter of tailstock sleeve, in.	4½
Floor space required, ft.	6 x 14
Size of motor required, hp.	20
Speed of motor, r.p.m.	1,200
Net weight of machine, including motor and accessories, lb.	18,000
Shipping weight, lb.	19,200





Views of the Operating Side and One End of a New Machine for Grinding Steel or Chilled Cast-Iron Carwheels Without Removing Them from Their Axles

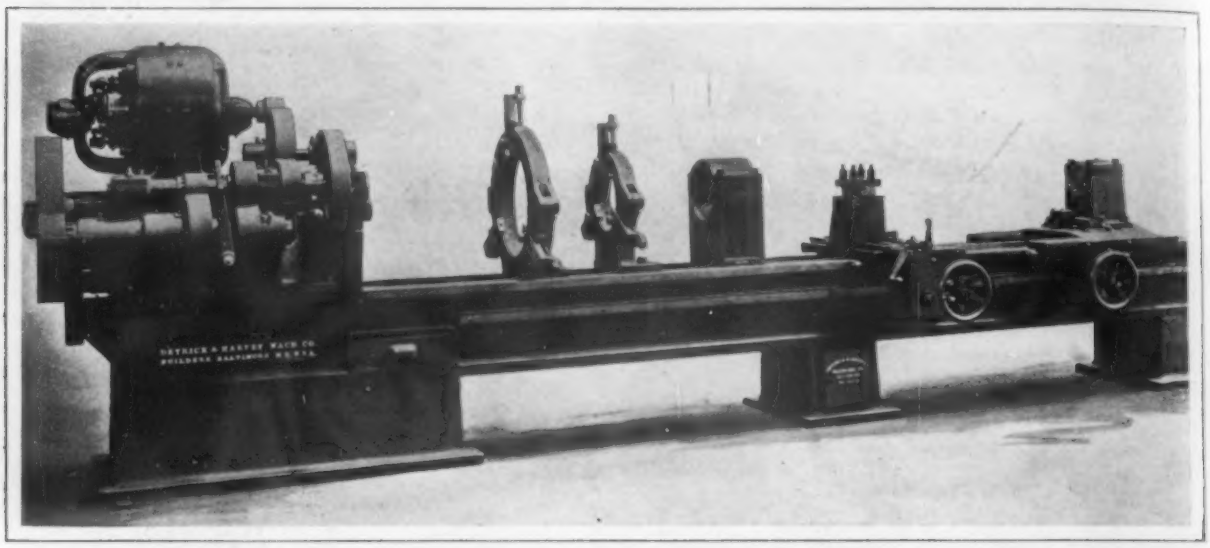
New Way to Make High Manganese Steel Castings

An interesting and rather novel plan for making small quantities of high-manganese low-carbon steel castings was recently hit upon by a steel foundry in the Pittsburgh district. A small order for steel castings containing 0.60 per cent. carbon and about 1 per cent. manganese had remained unfilled for some time because not enough tonnage was involved to make a special heat and it was not practicable to pour part of a 0.60 carbon heat into a separate ladle and add ferromanganese. The problem was solved and the order successfully and quickly filled by adding to the molds a calculated quantity of 98 per cent. pure carbon-free "manganese flour," the powdered metallic manganese of the Goldschmidt Thermit Company, now being used to harden the surface of certain types of steel castings as described in *The Iron Age* of April 30, 1914. This procedure did not raise the carbon, while the manganese flour was said to be readily and uniformly absorbed by the steel without causing blowholes or non-homogeneous steel. The similar use of ferromanganese would be likely to result in not only a higher carbon but also enough reaction in the mold to cause porous castings.

The new sheet mills of the Western Reserve Steel Company, Warren, Ohio, are nearing completion and will be placed in operation early in January.

A Motor-Driven Gun Boring Lathe

A lathe that is not designed for turning is somewhat of a rarity among machine tools. The Detrick & Harvey Machine Company, Baltimore, Md., has nevertheless developed a motor-driven lathe in which no provision is made for turning. This tool, which is illustrated herewith, is designed for use in connection with the manufacture of guns up to a maximum bore of 6 in. in diameter, and is designated as a gun boring lathe. The swing of the machine is 27 in. over the ways, and practically any length can be handled, up to 30 ft., a machine with a bed of this size weighing approximately 24,000 lb.



A Gun Boring Lathe Equipped with an All-Geared Motor-Driven Headstock and Provided with an Extra Carriage to Support a Tool for Cutting Off or Trimming the Work.

The lathe is equipped with an all-geared motor-driven headstock, the driving motor, which is rated at 10 hp., being attached directly to the headstock. The motor has a speed variation of 3 to 1, which in conjunction with the four gear changes provided enables work speeds ranging from 2 to 111 r.p.m. to be secured. Change gears provide for 10 reversible feeds ranging from 0.002 to 0.020 in., while by shifting a clutch, feeds ranging from 0.030 to 0.333 in. can be obtained, thus giving 20 feed changes in all.

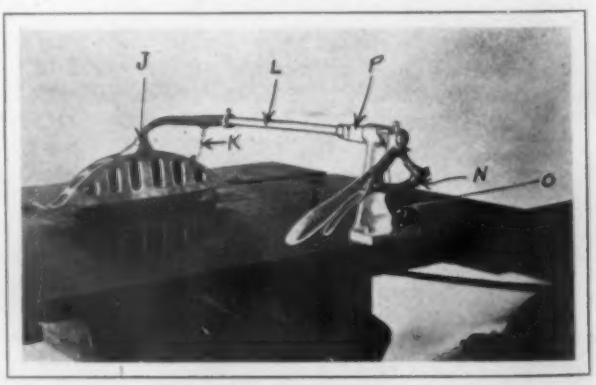
The spindle, which is a solid steel forging, 5¾ in. in diameter, is mounted in bronzed bushed bearings, each of which is 12 in. long. A threaded nose is provided on the spindle to receive chucks. All the driving gears and pinions are of steel or bronze, and the driving shafts have bronze bushed bearings. The thrust of the spindle is taken on a roller bearing measuring 8 in. in diameter, which is relied upon to reduce the friction at this point. The boring carriage has a bearing capable of accommodating bars up to 4¾ in. in diameter, and an extra carriage with a plain tool rest, having hand cross feed, is provided for cutting off or trimming up the work. Both of the carriages are fitted to the ways by square locks and have steel taper gibs for taking up wear. Power longitudinal feed, which may be disengaged at will, and the usual rack and pinion hand traverse are provided for the two carriages. With a view to avoiding unequal pull on the carriage the lead screw is placed between the ways directly under the boring bar. This screw is 3 in. in diameter and is held in tension between capped bearings in the bed with ball thrust bearings.

There are two steady rests furnished with the lathe, one for work ranging from 3 to 10 in. in diameter, while the other is intended for work between 6 and 18 in. in diameter. An oil pump driven by a 3-hp. motor is used to supply oil to the cutter through a telescoping tube. The large leg under the bed at the headstock serves as an oil reservoir, and is fitted with a strainer and removable chip pan. The bottom of the bed is inclined toward the reservoir, with a view to preventing the oil that has been used from being wasted.

An Adjustable Safety Saw Guard

For use on woodworking machinery to protect operators from injury, Hobart W. Curtis, foreman of the pattern department of the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has designed an adjustable safety saw guard. The working parts are made of steel and iron, while the guard proper is of aluminum, a combination which it is pointed out gives an efficient and rigid guard and also one that is easily and quickly adjusted to any position. It is possible to raise the guard a slight distance above the saw, and when it is not in use it can be raised to its full hight and moved to one side.

The guard swings on the pivot J and is prevented from hitting the saw by the chain K. An arm for supporting the guard is carried by the end of the horizontal shaft L. This arm is controlled by the handle M, which is equipped with a toothed segment N, and a pawl O, for locating the guard at the proper hight. A joint is provided at the point P in the horizontal shaft so that the guard, when not in use, may be swung out of the way.



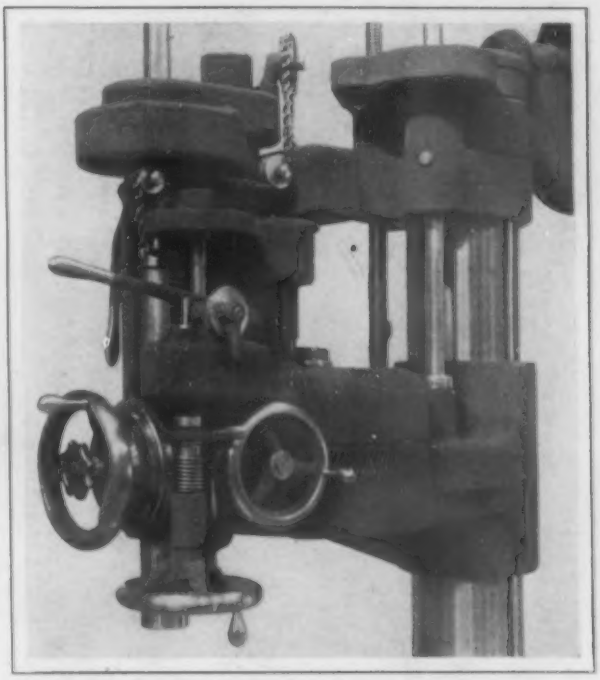
An Improved Form of Adjustable Safety Saw Guard Which Can Be Raised and Swung Out of the Way if Desired

A New Type of Radial Drilling Machine

The Willmarth Tool Works, 1516 East Thirty-second street, Cleveland, Ohio, has placed on the market a radial drilling machine which is new in principle of operation and design. The most noticeable point of difference is the method of moving the head and arm to locate the holes. The head rotates about a large circular bearing on the arm and the arm rotates about the column in the conventional way. This arrangement produces a double swiveling motion which is relied upon to locate any hole within the capacity of the machine readily

The column is of the post and sleeve type, the post of which has a large and heavy lower portion extending up to the top member to which it is bolted. The column sleeve telescopes and has bearings at both the top and the bottom, as well as a large ball thrust bearing at the lower end which is relied upon to assist in the swinging of the arm. The binding clamp at the lower end of the sleeve produces a practically solid column when tightened. The arm is of cylindrical box section with heavy internal ribs and is elevated or lowered by gearing at the top through a coarse pitch screw which is hung on ball bearings. The bearing of the head on the arm is 17 in. in diameter, and has an annular ring on the inside to keep it central and a heavy pivot bolt for holding the two together. A self-locking spiral gear and rack are provided for moving the head, and an eccentric clamp is provided for locking the head to the arm.

The spindle, which is finished by grinding, is 3¼ in. in diameter at the large end and 1¾ in. at the smallest point. It is provided with a No. 5 Morse taper hole and a large ball thrust bearing. There are eight speed changes, ranging from 35 to 375 r.p.m. Four of these are obtained by the steps of the cone pulleys, and this number is doubled by the back gearing which is provided in the spindle driving gears. The feeding mechanism is composed of a selective gear box driving a worm and worm gear, which in turn drives the feeding pinion. Six rates, varying from 0.006 to 0.027 in. per revolution of the spindle, are available, and any one can be secured by operating the dial on the front of the feed box. Quick return of the spindle is secured by a handwheel attached to the feed pinion shaft, and its engagement with the feed worm is made by a friction ring controlled by a nut in the front of the handwheel. Both depth gauge and automatic trip are included in the feed mechanism.



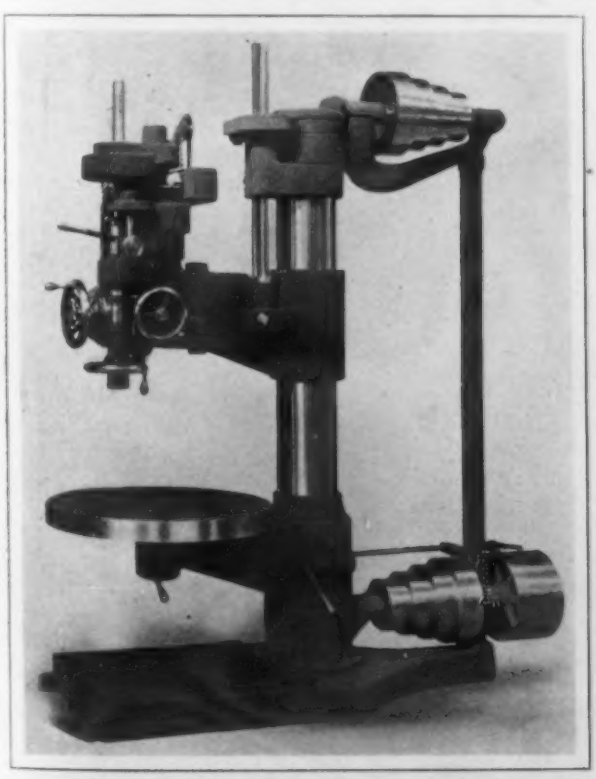
View of the Head and Arm Showing Arrangement of Controlling Levers and Handwheels, etc.

The tapping mechanism is obtained by a jack shaft in the head which runs at high speed and drives through ring clutches. These are self-adjusting and are operated by a lever at the front of the machine, which, it is emphasized, enables the workman to start, stop or reverse the spindle easily.

The following table gives the principal dimensions and specifications of the machine:

Vertical spindle traverse, in.	11¼
Vertical traverse of arm, in.	28
Maximum distance between spindle and base, in.	52½
Maximum distance between spindle and table, in.	27
Diameter of smallest cone pulley step, in.	8
Diameter of largest cone pulley step, in.	13¼
Face width of cone pulley steps, in.	3½
Diameter of tight and loose pulleys, in.	14
Face width of tight and loose pulleys, in.	4
Hight of machine, in.	96
Weight, lb.	3,500

The machine, which drills to the center of a circle 48¾ in. in diameter, is regularly equipped with a round table, as shown. If desired, however, any style can be supplied on special order.



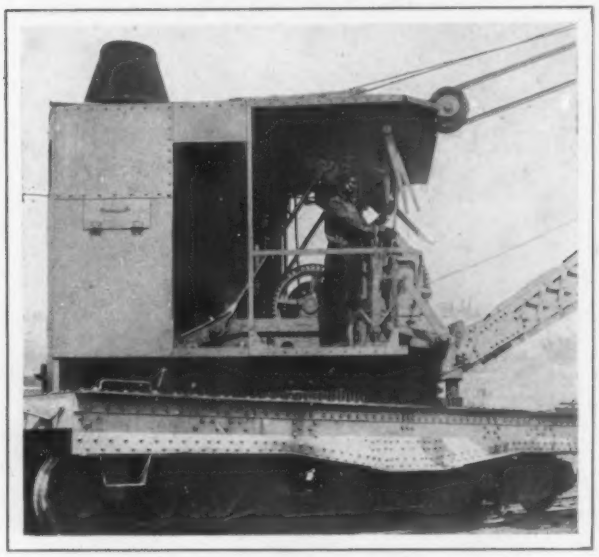
A New Type of Radial Drilling Machine in Which the Head Is Rotated on the End of the Arm Instead of Sliding Along It

The Armstrong-Whitworth Plant in Canada

The opening of the Canadian plant of Armstrong-Whitworth of Canada, Ltd., Longueuill, Que., on the St. Lawrence River, directly opposite Montreal, December 12, draws attention to the growing importance of the steel industry in the Dominion. The units now in operation place this company in a position to turn out the highest grade of steel, tools, etc. The occasion of the opening was made a formal one for the visit of prominent Canadian manufacturers and financial interests. M. J. Butler, a director of the company, under whose supervision the construction of the plant has been successfully carried out, acted as host to the visitors. The plant consists of steel works, rolling mill, hammer department and machine shop, all representing modern progress. The company has a site of 250 acres extending to the river front. The floor area of the units now at work covers 66,000 sq. ft. Every attention has been paid to the comfort of the employees. Their number will soon be 500, as expert hands are en route from Sheffield and other manufacturing points in England.

Locomotive Crane of Heavy Construction

A new type of locomotive crane that has recently been brought out by the Cleveland Railway Supply Company, Citizens Building, Cleveland, Ohio, has a number of distinctive features de-



A Locomotive Crane Which Is Characterized by Heavy Construction and a Large Rotating Bed

signed to insure hard service, efficiency and speed in operation. Some of the important features include heavy construction of the machine, large and heavy traveling mechanism, powerful engines, an independent engine for rotating, a large rotating bed or ring, a low center of gravity, rapid boom hoisting and lowering mechanism, accessibility of parts and large coal and water capacity.

The bed of the machine is of rigid and heavy construction. The car frame is built of two heavy longitudinal side girders between which are heavy cross beams properly spaced to support the roller bed, upper structure and propelling mechanism. The frame is mounted on two four-wheel standard M. C. B. trucks with 33-in. wheels and heavy special axles and a 20½-ft. wheelbase. The rotating bed is 105 in. in diameter or about 18 in. larger than the general practice. The advantages claimed for the larger bed are additional stability and less racking with heavy loads. The lower ring is composed of 44 conical rollers of ample diameter and face to carry the load. These rollers are attached by pins to a spider which has a bearing on the center pin of the crane, insuring an alignment of the rollers. The rotating bed that carries the hoisting, rotating and traveling mechanism is a heavy machined casting, resting directly on the rollers.

The engine for raising and lowering the boom and the load and for traveling has two vertical cylinders 9 in. in diameter with a 12-in. stroke. Rotation is accomplished by a swinging engine with a 4 x 6-in. cylinder mounted on the rotating bed. The advantages claimed for an independent engine drive for rotation instead of using one engine for all operations is that the control is easier in rotating fast or slow as may be required, a smooth, quick acceleration is assured, jerking caused by the operation of the clutches is eliminated, and the operation of two clutches is avoided.

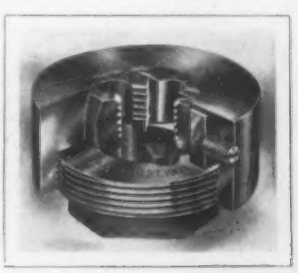
Power for traveling is applied to one axle on each truck through bevel gears and pinions and two clutches for driving the crane in either direction without reversing the engine. The hoisting drum which is 20 in. in diameter is driven by gears and pinions and is operated by a clutch. Control of the load is through a strap brake operated by both foot and hand levers. For raising and lowering the boom a 12-in. drum, connected to a worm gear, is mounted in the top structure of the crane, the ropes leading directly from the drum to the sheaves in the head of the boom and thence to the purchase blocks connected to the top structure, thus giving the ropes a good leverage for the support of the boom. The crane is rotated by a pinion meshing with teeth on the outside of the rotating ring, the pinion being driven by the rotating engine, worm and gear.

The hoist and travel clutches are of the disk friction type, one-half of the disk having a contact surface covered with asbestos facing, which runs either with or without oil. The gearing in general is of cast steel and the small pinions are of forged steel. The teeth, fulcrum gear and the pinion which meshes with it, are all cast steel. All other gears have cut teeth. Cold rolled shafting is used for shafts 3½ in. in diameter and under, larger sizes being forged. The bearings throughout are bronze bushed.

The operating mechanism is low down, making a low center of gravity and increasing the capacity. The operator's position is on the right side of the crane, a little forward of the center, where he can see the various operations without any obstructions to his view. All the mechanism is accessible without dismantling the crane or taking out parts. Bunker capacity for 2000 lb. of coal and water storage capacity for 500 gal. are provided. The crane is built in standard sizes from 15 to 30 tons inclusive, and with booms from 30 to 50 ft. in length. It is designed to travel at speeds of from 600 to 1000 ft. per min. and has a rotating speed of 3 to 4 r.p.m. The hoisting speed depends upon the load.

A New Hexagonal Guide for Screw Plates

To enable die adjustment to be made readily in screw plates, the Conant & Donelson Company, Conway, Mass., has brought out an improved type of guide. It is hexagonal in form and can be turned with an ordinary monkey wrench. The arrangement and use of the guide is clearly brought out in the accompanying illustration. One of the fields in which it is pointed out the guide will be found useful is where it is necessary to cut over a thread, and the available space is not sufficient to permit the die stock to be turned around. Under these conditions it is emphasized that the new guide will be found of advantage, as it is simply necessary to take a monkey wrench and turn the die around in this way.



A New Hexagonal Guide for Holding Dies in a Screw Plate That Is Capable of Adjustment with an Ordinary Wrench

The Reynolds Electric Company, 422-428 South Talman avenue, Chicago, Ill., announces a second important decision relating to Reco color hoods, the Court of Appeals having affirmed the lower court in a decision handed down December 6, sustaining all the legal rights relating to them. The suit has attracted much attention and has been under considerable discussion by the trade.

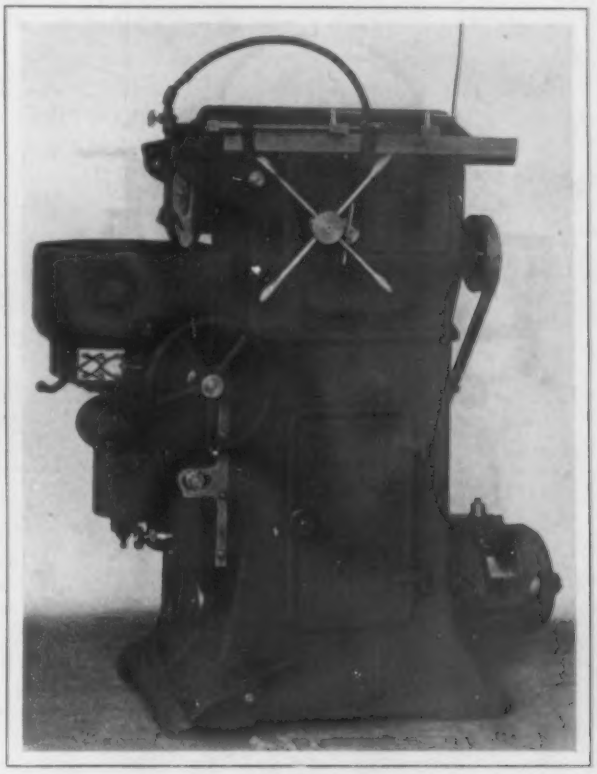
New Disk and Surface Grinding Machine

A rotary disk and surface grinding machine embodying a number of interesting features has been placed on the market by the Walker Grinder Company, Worcester, Mass. The grinding wheel does not overhang the ways at any time, and the speed of rotation of the work and the amount of feed are automatically accelerated as the wheel approaches the center of rotation of the work and retarded as it recedes. The work handled by the machine is flat pieces and piston rings, the machine in use for finishing one of the latter being illustrated in one of the engravings.

The machine is self-contained, and no overhead shafting is necessary for its operation. The tight and loose pulleys are incased and the belt shifter is operated by a treadle. The grinding wheel, which is 10 in. in diameter and has a feed of 3/16 in. per revolution of the work, is suspended underneath the ram, which runs on V tracks, having an extension toward the work. In this way, it is pointed out that irrespective of the position of the wheel slide or the ram, the grinding wheel does not overhang the ways. As the wheel feeds toward the center the speed of the work is increased automatically 100 per cent. in 5 in. of movement of the ram and a surface of 400 sq. in. is gone over in 1 min. This arrangement and a corresponding retardation as the wheel recedes from the center is accomplished by the operation of an Evans cone located in the interior of the column.

The grinding wheel spindle is driven by a belt coming up from the driving pulley mounted on a shaft in the base of the machine. This shaft also mounts a pulley for driving the variable-speed mechanism and the water pump. The reversing mechanism is of the bevel gear and positive clutch type, the shifting member being impelled by a pivoted vertical lever operated by dogs on the ram. An automatic stop device which operates after the wheel passed beyond the work is brought into play by the action of a knurled sleeve coming in contact with a bell crank lever at the end of the stroke, thus disengaging the work spindle clutch. To start the feed this knurled sleeve is given a slight rotary motion, which releases the clutch.

The knee can be tilted to enable the machine to grind either concave or convex, this adjustment being secured by a screw. A hardened steel screw and button which are set permanently so that the machine will grind flat work when both are in contact is employed to set the tilting knee in a straight position after it has been thrown out of alignment. To turn out concave work it is simply necessary to unloosen the check nut and turn the adjusting screw until the proper degree of angularity is secured. Convex grinding is obtained by backing off the adjusting screw.



Front View of a New Combination Rotary Disk and Surface Grinding Machine

Automatic vertical feed which is operated by dogs on the edge of the ram the same as the longitudinal feed is provided, and an automatic arrangement is relied upon to stop the operation of the grinding wheel when the proper thickness has been reached. The feed is positive and is regulated by a ratchet and pawl arrangement; it can be had at both ends of the stroke. The ram can be stopped by hand at any point in the stroke.

The machine is fitted with one of the builder's magnetic chucks, which can be furnished in various diameters between 8 and 12 in. The floor space occupied by the machine measures 3 x 5 ft., and the net weight of the machine, with a 12-in. chuck, is approximately 2000 lb.

The Machine Employed for Grinding a Piston Ring Which Is Held in Place by a Magnetic Chuck

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The Erie Pump & Equipment Company, Erie, Pa., just organized, is a consolidation of the Erie Pump & Engine Works, whose sand gravel dredging pumps and general contractors' pumps have been well known to the trade for the past 20 years, and of the Northern Equipment Company, also of Erie, manufacturer of the Copes boiler feed water regulators and governors. Manufacturing will be conducted at the plant of the Erie Pump & Engine Works, which is located in the heart of the city, close to all railroads, so that the best shipping facilities are available. The officers of the new company are as follows: E. W. Nick, president and treasurer; D. H. Du Mond, vice-president; V. V. Veenschoten, secretary. John H. Dougherty, who for a number of years has been in the employ of the Jeansville Iron Works as designer of centrifugal pumps, has been engaged to take charge of the designing of pumps. John G. Pfadt, who was president of the Erie Pump & Engine Works, is not connected in any way with the new concern.

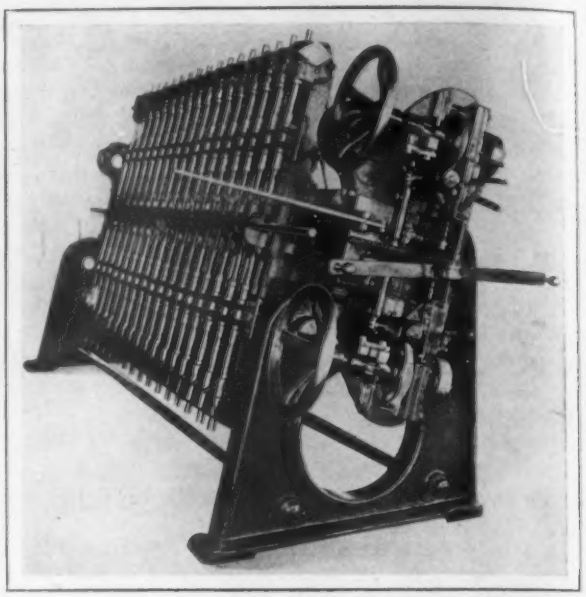
PIPE DRILLING MACHINES

Use of Two Sets of Adjustable Spindles for Simultaneous Piercing of Opposite Walls

The Valley City Machine Works, 12 Campau avenue, Detroit, Mich., has recently designed an interesting type of gang drilling machine. These are intended for drilling holes in pipe and the opposite walls are pierced simultaneously. The holes are drilled by pairs of spindles which operate on the pipe from above and below. Two of the machines are illustrated, one a four-spindle and the other a 34-spindle machine.

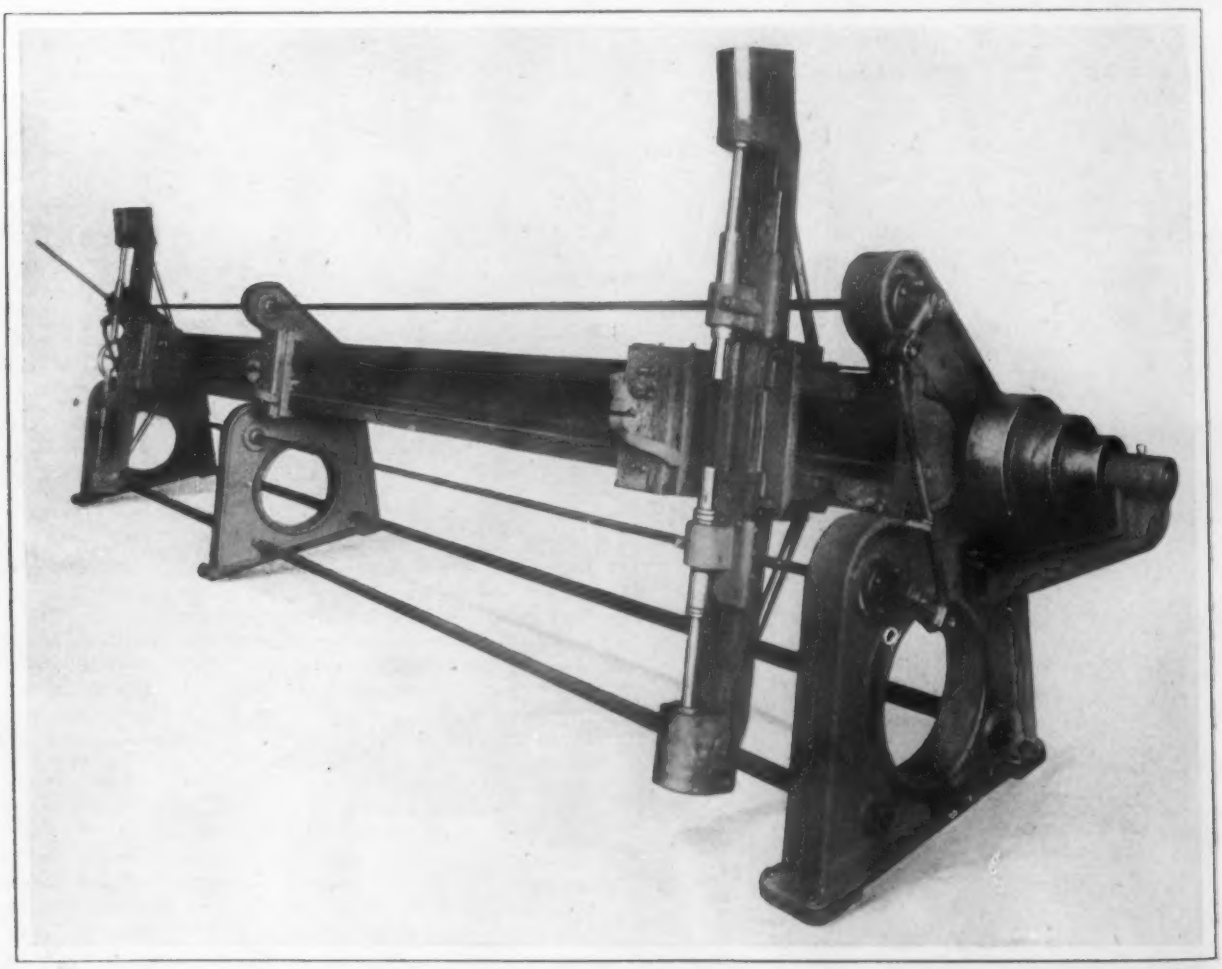
Essentially the machine consists of a rail supported by as many legs as are necessary and carrying the required units of drill spindle brackets which can be varied to suit the requirements. It will be noticed from the illustrations that the rail is set at an angle, this arrangement being relied upon to enable the operator to handle the work with the least expenditure of effort. The rail also carries self-centering clamping jaws which are operated by a splined shaft, worm gears and rack and pinion shown at the right of the 34-in. spindle machine. The spindles can be adjusted both as to center distances and the length of drill used, the minimum center distance being 4¾ in.

The horizontal lever at the right imparts a sliding movement to the clamping jaws to move the work longitudinally to different positions or stops. This enables any number of holes, which is an exact multiple of the number of pairs of spindles, to be drilled at will. Where the number of holes is an odd multiple only one set of drils is used and, of course, the holes are drilled only in one wall of the pipe. Where the number of holes is an even multiple both sets of spindles operate unless it is desired to have the holes bored in one wall only.



Front View of a Machine with 34 Spindles and Automatic Power Feed for Each Gang

The power for driving the machine is transmitted through a belt connection to the main driving shaft and from there to the spindles of both sets through rods and sets of bevel gears. The four-spindle machine is equipped with hand feed, the controlling lever being located as shown at the left end. On the 34-spindle machine a power feed with automatic stop is provided for each gang of spindles. The four-spindle machine is 20 ft. long, while the other one is capable of handling work up to a maxi-



A Four-Spindle Machine with Hand Lever Feed for Drilling the Opposite Walls of a Pipe Simultaneously

mum length of 10 ft. and weighs about 6000 lb. The floor space required for the latter machine is 4 x 14 ft.

Double-Piston Hand Hydraulic Pump

A combined quick-acting and high-pressure hydraulic pump for general purposes has been placed on the market by L. Henderer's Sons, Wilmington, Del. This pump is equipped with two pistons which enables a continuous discharge to be secured, but the principal feature of the combination is the variation of pressure that can be obtained. It is possible to use the pump for a number of different purposes, one of which is in conjunction with a ram for use as a hydraulic jack. With the combination of the two pistons a pressure of 6000 lb. per sq. in. can be procured from the smaller one of ¾ in. in diameter and a pressure of 1000 lb. from the larger piston, which is 1½ in. in diameter. It is pointed out that when the low-pressure piston is rising the high-pressure one is on its downward stroke.

A New Double-Piston Hand-Operated High-Pressure Hydraulic Pump

Referring to the accompanying illustration, 1 is the high-pressure piston and 2 the low-pressure one. When the capacity of the latter piston is to be exceeded the release wheel 3 disengages it and leaves the high-pressure piston ready for use. This piston can be operated under all working conditions, and it is possible to release all the load pressure by manipulating the release wheel 4, which governs the return of the liquid to the pump reservoir.

The pump illustrated has a stroke of 3 in. and an over-all hight of 34½ in. It weighs 190 lb. with a reservoir base having a capacity of 1200 cu. in., but the capacity of the base can be changed to suit the requirements of various cases. This is also true of the diameters of the pistons where working pressures other than 6000 and 1000 lb. per sq. in. are required.

The Republic Stamping & Enameling Company, Canton, Ohio, gave as a Christmas present to each employee in its service six months or more a life insurance policy equal to about the amount of his annual wages. The employees were insured under the group plan at the company's expense, about 400 workmen being the beneficiaries. Each man's policy remains in effect as long as he is an employeee of the company.

The W. H. Hoover Company, New Berlin, Ohio, has recently received a $200,000 order for harness parts to be supplied to the British Government for war purposes. The plant is being operated night and day filling the order.

A Pyrometer Using Metallic Salt Pastes

As a substitute for the Seger cone method of determining temperature, the Carl Nehls Alloy Company, 248 Brush street, Detroit, Mich., has developed a new method in which it employs various kinds of metallic salts which are made into mixtures that will melt down at different temperatures ranging from 2200 to 1330 deg. C. It also uses these pastes in place of pyrometers, as well as for checking instruments. One of the claims is that the material can be used several times without impairing the accuracy of the indications.

The salts are put up in the form of a paste which is packed in a tin and lumps of pastes with various melting temperatures can be placed on a steel bar as shown in the foreground of the accompanying illustration. This can be inserted in ovens, retorts, flues, gas mains, steam pipes, etc., to find the temperature at which they are operating. The salts having a melting point lower than the temperature present will of course melt and a comparison with those that remain solid will indicate the temperature which would be between the two melting points. The use of a long bar, it is pointed out, makes it possible to determine whether the temperature is uniform in the front and back, top and bottom or corners of a furnace, oven, kiln, etc.

A New Type of Pyrometer in Which the Melting of a Paste of Metallic Salts Indicates the Temperature

Another way in which these salts can be used is to cast them into solid cylinders approximately 7/16 in. in diameter and ¾ in. long. For all temperatures below 932 deg. F., these pastes are used in an air tight glass tube, such as is shown in the central background. This, it is pointed out, enables the salts to be used over and over again, as they melt each time the temperature rises above the point of liquefaction and solidify when the temperature falls below. One way of using these cylinders is to plug one end of a tube or pipe and drop in a cylinder, lowering a small rod into the tube until it rests on the salt. When the salt liquefies the rod will lower and thus indicate that the melting temperature of the salt has been reached. This, it is pointed out, is useful for finding the temperatures of metals in a molten condition, salt bath furnaces employed in heat treatment, etc.

Where it is desired to find the exact temperature of tools heated in a forge fire, a paste is used that represents the correct hardening temperature for the tool. This paste is daubed on the tool and when it is heated to this temperature the salt will melt and the tool can be taken out of the fire. In using this method it is recommended that the tool be surrounded by a piece of sheet steel or inserted in a gas pipe, as that keeps the paste from coming in contact with the fuel.

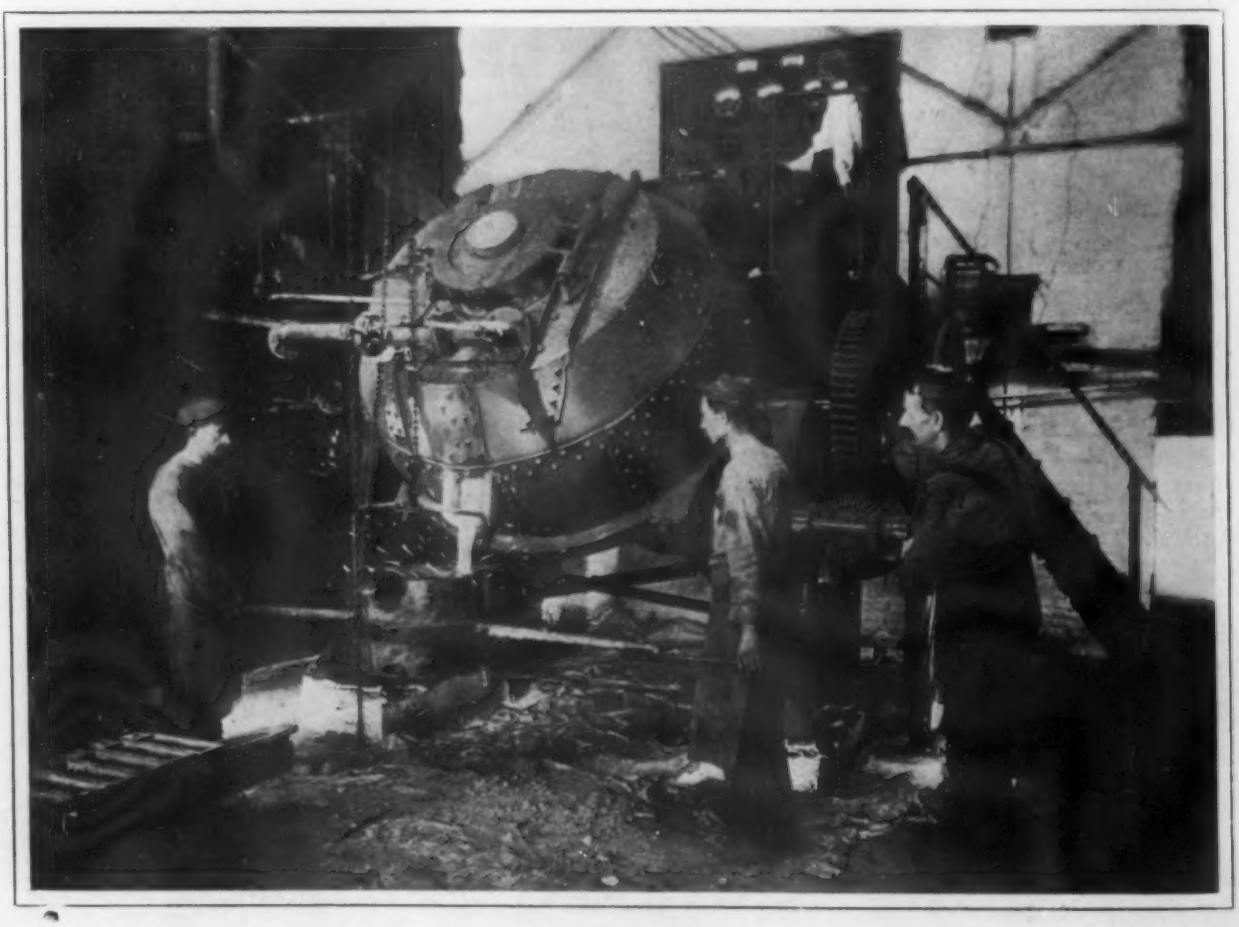
Brass Melting in an Electric Furnace

A New Type Which Utilizes the Pinch Effect and Is Now Commercially Melting Brass and Bronze Chips

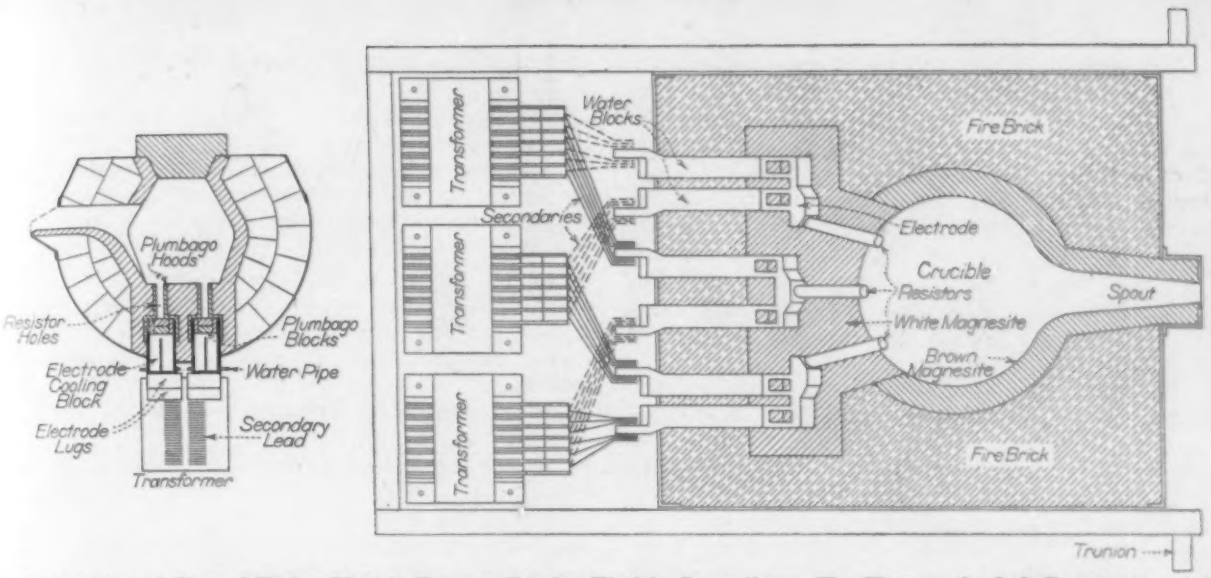
The possible use of the electric furnace in the brass foundry is gaining important recognition lately as an improvement over existing melting methods. A furnace that is making rapid strides in this field is the one described in a paper before the American Institute of Metals at Chicago in September by G. H. Clamer of the Ajax Metal Company, Philadelphia, Pa., and Carl Hering, consulting engineer, of the same city. The furnace has a double interest in that it is expected that future developments will place it in the list of highly efficient electric furnaces for melting steel. It is known as the Hering furnace. Extracts from the paper referred to are as follows:

In the particular type of furnace used in these researches the heat is set free as such in a small portion of the liquid metal in some heating holes at the bottom of the hearth, and then by means of a pressure produced by a recently discovered and peculiar electromagnetic force known as the "pinch effect," this heated metal is "squirted" with a considerable force into the main bath, whereby its heat is carried very quickly as hot metal into the bath and is there distributed, and whereby the metal is at the same time very thoroughly stirred, making it uniform. The cold metal is melted by immersion in this hot bath, as in all covered crucible melting. Cold metal, when immersed in superheated liquid metal and wetted by it, takes up heat remarkably rapidly, and anything that increases the speed of melting lowers the standby losses; hence poking the cold metal down into the hot bath is an advantage. This "pinch pressure" operates like a valveless pump, forcibly expelling the freshly heated metal from the heating holes or channels, called resistors, and sucking in the cooler liquid metal from the bath.

This peculiar and heretofore unknown electromagnetic force, which is of considerable magnitude is the first mechanical force internal to a conductor, known to the electric art, all the other forces being external. In the present type this force is applied to circumferentially closed channels of liquid metal submerged beneath the bath, so that rupture cannot longer take place; the force tending to crush the conducting column of liquid metal is made to "squirt" it out of the heating holes, whereby the absolutely essential rapid circulation in these heaters is produced. This type of furnace is sometimes referred to as the "pinch effect furnace," as this peculiar force is its underlying and essential feature. Such a furnace heats the liquid metal from the bottom, which is the correct way to heat any liquid, and of course the most rapid way. Due to this rapid heating the losses of heat are reduced because the time during which the metal is kept hot is shortened. If a ton of metal per hour is melted and poured in 500-lb. lots every 15 min. in a small furnace, the continuous stand-by losses through the walls and the top will be only those from 500 lb., while if the metal is melted and poured in ton lots



The Hering Electric Furnace Pouring Brass



Cross Section and Plan of Hering Electric Furnace Showing Electric Connections. The View on the Left Represents a 120-Kw. Two-Phase Hering Brass Furnace and the One on the Right a 150-Kw. Three-Phase Hering Steel Furnace

every hour these losses will be several times as great.

The ideal method therefore is to melt and pour as quickly as possible, hence in as small lots as the particular conditions of the foundry require, though this of course need not be carried to extremes. It is thought, however, that for small castings at least, a high power tilting brass furnace of this type could be constructed small enough to be transported to the molds, pouring directly into them, thereby saving the process of pouring with a ladle with its labor cost, and the cost of the superheat necessarily involved in indirect pouring.

CONSTRUCTION OF THE FURNACE

In general this furnace consists of a shell lined so as to form a hearth. At the bottom of this hearth there are several cylindrical holes, usually inclined, extending into the lining and terminating at their outer ends by the metallic electrodes, usually made of the same metal as that to be melted, or of graphite. The electric current led into the furnace by means of these electrodes passes through the columns of liquid metal in these holes, and it is here that the electric energy is converted into heat and from which the freshly heated metal is squirted out into that in the hearth. These heating holes are technically called the resistors, as it is the electric resistance of the metal in these holes which causes the electric energy to be converted into heat. The electrodes lead out to the outside of the furnace, where they are attached to transformers in which the kind of current required by this furnace is generated. These transformers are preferably secured mechanically to the shell, hence the heating can continue, while the furnace is tilting for pouring.

In starting from the cold state this furnace must first be primed with a small charge of liquid metal, enough to fill the holes and the bottom of the hearth, so that the circuit for the current is established. A few fragments of zinc, tin or aluminum inserted in the bottoms of the holes insure the union of the liquid priming metal with the electrodes at the first start from the cold. During regular pouring enough liquid is retained to maintain this electric circuit.

On shutting down the furnace it is tilted or drained so far that the heating holes are also emptied of their metal except for a short stump at the bottom. In some cases the charges in the furnace were allowed to freeze and it was afterwards started up again by melting the solid charge with the current; but at present this is not recommended as a general rule except when the metal in the furnace is not hot short, as hot short metal is apt to break the electric circuit by cracking in the resistors when the furnace cools or is heated up. A blast fuel flame is desirable for starting up a furnace with a frozen charge.

An electric furnace has its best efficiency when run continuously day and night; this is also better for the lining, which may become strained by repeated heating and cooling. The cost of electric energy is also generally less per kilowatt hour for continuous than for intermittent supply. When this continuous running is not practical, this furnace may be kept hot over night with about 20 per cent., or even less, of its normal input. A large body of metal in a well heated and well insulated furnace will probably keep liquid in the bottom for a number of hours, perhaps all night, without any current.

In its present form this brass furnace is eminently practical. It requires very little attendance while running normally, and it is at its best when run at a uniform rate of melting. One operator can well attend to several furnaces or undertake some other duties. It requires intelligent care when starting from the cold to establish good electrical contact with the fluid priming charge; this starting is easily learned, but must be done conscientiously; after that first starting no particular care is required.

The chief attention required during normal running is not to waste electric energy or endanger the lining or the electrodes by unnecessarily high temperatures, as the heat accumulates rapidly after the metal is all melted; its temperatures had best be determined by the use of pyrometers, which is convenient in this type of furnace.

Any degree of superheat can of course be obtained, depending only on the money one is willing to spend for this superheat. One need merely keep the melted metal in the furnace with the full current on.

SOME PRACTICAL ADVANTAGES

There is no danger at all of "burning" or oxidizing the metal, as the air can be entirely excluded and the atmosphere may even be made reducing with charcoal. Sulphur fumes are of course absent. The zinc loss is practically negligible, as the furnace is normally sealed, being opened only for charging and pouring. The regular and continuous upward motion of the metal squirted from the heating

holes brings all the molten metal repeatedly to the top, where all suspended matter is released and then floats. Hence there takes place a kind of mechanical refining of the metal; it may be said to be in effect as though the melted metal had been strained through a filter. The loss of brass in the ashes in the ordinary fuel melting processes is, of course, entirely avoided. This, together with the practically negligible loss of zinc as fumes, means a saving in the metal, and the value of the metal thus saved goes well toward paying for the current, and in some cases may equal it.

The flow of metal in the heating holes is downward at their circumference and upward in the center, hence is in both directions; the outward velocity is by far the greater; there is really a suction at the surface of the holes, hence an absence of erosive action, the flow is steady and not intermittent. We estimate that each particle of metal is in the holes on an average roughly about a second and is heated about 50 deg. C. (about 90 deg. F.) higher than when it entered, but these figures are naturally only very rough estimates and vary greatly with the design and the metal.

It is quite surprising, however, what a large amount of heat can be carried out of these holes effectively by the rapidly flowing metal; it exceeds that of a row of electric arcs in those holes. At present about 25 to 50 kw. are converted into heat in each hole (or roughly about 90,000 to 200,000 B.t.u. or 20,000 to 45,000 kg. cal. per hr.) with the probabilities that this can be considerably increased. The correct proportioning of these holes and the current are of great importance. These proportions are quite different for brass than for steel. The furnace must be especially designed for each metal, though variations in the compositions of brasses and bronzes can, however, be taken care of in the same furnace by regulation of the electric current.

Even copper, with its very low resistance, can be melted commercially in these furnaces without requiring impractical proportions. The higher the electrical resistivity of a metal the better the proportions become.

CURRENT VOLTAGE AND AMPERAGE

The rapid flowing of the metal in the heating holes, which is the basis of this type of furnace, is a phenomenon based on the use of a large current, hence these furnaces must be operated with low voltages and great amperage. For this reason the currents are best converted by transformers attached directly to the furnace, as long leads for such large currents would be expensive and troublesome. Our researches have shown, however, that the currents may be much smaller than was at first supposed. Our brass furnace is running with about half the current originally intended and double the voltage.

Under normal conditions the current is perfectly steady, hence these furnaces become a very desirable "load" for central stations, and may for this reason be granted lower rates, especially as the current need not be cut off during pouring, and because the furnace could easily be cut out of circuit (except for a small current to keep it hot) during the time of the so-called "peak" loads, during which the charges for current are necessarily and justly somewhat higher. Any of the usual alternating currents used for lighting or power can be adapted to this furnace, as they are always transformed at the furnace to the required voltage and current. Single-phase, two-phase or three-phase currents can be used without any complications; there being then two, four or three heating holes; three-phase current is probably the best and is the kind most generally available. Any frequency may be used, although, of course, the lower the frequency the better.

The power factor of this furnace, even with 60 cycles, is not low, as has been supposed, but was found to be in the eighties and nineties, and even this small reduction from 100 per cent. was no doubt largely, if not all, in the transformers, and could be avoided in a better design of the transformers. In a steel furnace with a frequency of 25 the power factor was practically 100 per cent., hence perfect. This factor has nothing to do with the efficiency, but merely means larger electrical parts when it is considerably below 100 per cent.

As the top and all but one side are free from all electric appliances, the slag or skimming doors, spout, feeding hopper, roof, etc., may be located and constructed as the owner prefers. The furnace may readily be made to tilt around the spout or lip as a center, thereby facilitating casting directly into molds, which, of course, saves considerable expensive superheating and labor.

This type of furnace is applicable to quite small as well as to quite large sizes. We believe they can be made small enough to transport to the molds, or to be applied to a pouring ladle to keep the charge at a constant temperature. Large sizes may be made by simply increasing the number of heating holes, if any difficulties should arise in making these holes of larger capacity, which is not anticipated. But our belief is that very large furnaces are not as desirable as smaller ones of high power giving the same daily output; that is a matter of choice of the owner.

MELTING BRASS AND BRONZE CHIPS

The furnace has so far been used for melting very light brass and bronze chips, which gave trouble in the fuel furnaces. In melting many tons of these light, curly and oily brass chips with much mechanically mixed iron, we cast in the form of clean ingots nearly 8 lb. per kwhr., delivered to the furnace transformers, equal to about 12.5 kwhr. per 100 lb. poured; a considerable portion of this energy went into the dross and was lost through the open hopper, through which the cold charge had to be "poked." Moreover, the transformers were not working properly and were wasting much heat, and in this particular furnace there were four electrodes (for a two-phase current), instead of only three (for a three-phase current), which latter would be more general, hence the electrode losses were greater than they would be normally, and the electrodes had been proportioned for a much larger current, hence were unnecessarily wasteful in heat loss.

Short runs, with clean ingot charges, indicated that, even with these easily-avoidable excesses in the losses, 10 lb. per kw. hr. could be obtained in this furnace, hence in better designs even still better efficiencies than this can reasonably be expected. But, as said above, this figure depends largely on the amount of superheat required by the particular foundryman.

COMPARATIVE COST WITH FUEL FURNACES

Comparative costs with fuel furnaces can be only crude because the data concerning them differ so very greatly in different foundries. But taking what appear to be fair general averages largely from the recent Bulletin 73 of the Bureau of Mines compiled by Dr. H. W. Gillett, the following rough comparisons can be made:

He concludes that the average loss of metal in fuel

furnaces is about 2.5 per cent. per melt; it is probably greater in most foundries, and as this is the largest item of expense with fuel furnaces, it is hardly fair to the electric furnace to take it so low; but we will assume this low figure and allow ½ per cent. for the electric furnace. Limiting this comparison to only the fuel or current, the crucibles and the loss of metal, gives the following per 100 lb., assuming $4 per gross ton for the coke, and the average value of the metal as 10c. per lb., based on the present low metal value, ordinarily it averages about 50 per cent. higher:

	Cents
Pit, natural draft, coke, furnace:	
Coke, 45 lb.	8
Metal loss, 2.5 lb.	25
Crucibles	7
Total	40
Pit, forced draft, coke, furnaces:	
Coke, 35 lb.	6.3
Metal loss, 2.5 lb.	25.0
Crucibles	7.0
Total	38.3
Tilting, forced draft, coke, furnaces:	
Coke, 20 lb.	3.6
Metal loss, 2.5 lb.	25.0
Crucibles	6.0
Total	34.6
Open-flame, tilting, oil furnaces:	
Oil, 3 gal. at 4c.	12.0
Metal loss 3 lb.	30.0
Relining	1.2
Total (to which should be added the cost of the compressed air blast)	43.2
Electric furnace:	
Power at 1c. per kwhr. and 10 lb. per kwh.	10.0
Metal loss ½ lb.	5.0
Relining	1.2
Total	17.2
Power at 1.5c .per kwhr. and 8 lb. per kwhr.	18.8
Metal loss ½ lb.	5.0
Relining	1.2
Total	25.0

The labor cost for charging, pouring and attending to the operation of the furnace may be the same, but the cost of starting the fires and for the handling of the coal and ashes are absent in the oil and electric furnaces and should therefore be added to costs for the coke furnaces. In the wrought brass industry there is a saving of labor with the electric furnace due to larger ingots, which would no doubt be a much greater item than the difference in cost of melting.

In the above tabulated data, taking as an average 38c. per 100 lb. for coke furnaces and 20 for the electric, the saving in a plant melting 20 tons per day would be nearly $22,000 per yr. of 300 days; or for oil furnaces at 43.2 and electric at 20c. the saving would be nearly $28,000 per yr., which should be credited to the first cost of the electric furnace.

In estimating the cost of melting it is important to consider not only the price per kilowatt hour of the electric energy and the other items tabulated above, but also the numerous other factors, like the cleanliness of this "boiled" metal, the avoidance of oxidation, or of the formation of sulphides, the possible uniformity of temperature, the production of any desired superheat, the possibility of casting directly into the molds with its saving of labor, the comfort of the laborers, the economy of floor space, the increase of output by running day and night, the absence of handling of coke, ashes, oil, compressed air, etc., the saving of time in starting fires, etc., all of which have a money value also which may in some cases be even a larger factor than the mere cost of the power alone. On the other side of the account is the cost of the furnace, the cooling water, its attendance (one man who could easily attend to several furnaces), and the relining; under normal running conditions there is nothing about the furnace which is consumed or wears out except the lining; the electrodes are not consumed. This furnace gives the owners of a foundry increased opportunities to carry out what is known as scientific management, or, in other words, to get the best returns per dollar invested in the plant and in its operation.

The development of this type of furnace involved many difficulties largely because it was an entirely new and somewhat radical departure from existing practice, hence no precedents existed. All the data for constructing it had to be found out experimentally, and each trial furnace had to be run to destruction to bring out its weak points. Our scrap heap contained probably about fifty furnaces. Furnaces of this type must, moreover, be carefully calculated and designed in their electrical parts or they will not operate satisfactorily.

Since this paper was read a Hering furnace has been running commercially at the plant of the Ajax Metal Company, Philadelphia, Pa. It has a capacity of about 150 lb. and has been running satisfactorily night and day, melting down large quantities of very impure scrap which could not be handled in the ordinary fuel furnace. A striking feature of its operation is the small amount of attendance required, it being left in charge of a lad, who has plenty of time to attend to other duties. Another reported feature is that quite a large amount of refining is accomplished during the melting in that suspended impurities are all brought to the top and skimmed off. Very impure metals have come out quite uniform and the ingots show a fine fracture.

German Steel Works Union on Trade Conditions

The regular statement of the German Steel Works Union, issued after its last meeting on December 3, gives the following general review of the condition of the German steel trade:

A number of domestic consumers of semi-finished steel who were compelled to cease operations because of the war have gradually resumed. A considerable advance in domestic sales is not looked for in view of the present condition of the market for finished material. Prices for the first quarter of 1915 are maintained at the present rate and conditions. With neutral countries a few large projects have become active.

In railroad material the orders of the Bavarian and Saxony state railroads for their requirements for 1915, already mentioned in a previous market report, have actually been placed. The orders for track fastening for the Prussian state railroads have been allotted to the syndicated works. Important contracts from neutral countries have been received and further inquiries have appeared. In mining rails the demand was better in November than in October. A large number of mining companies have contracted in the usual manner for their requirements of mining and small rails, with the necessary accessories, for 1915. The tramway rail business has taken on a more favorable aspect in the last few weeks, since orders for domestic account as well as for neutral countries have been obtained.

Domestic demand for shapes has declined, which is explained by the unfavorable season of the year as well as by the decided quietness in structural lines. Prices are to remain unchanged for the first quarter of 1915. There have been no developments in foreign demand since the last report, business being confined to neutral countries. Inquiry is not as brisk as in September and October when depleted stocks had to be replenished.

The next regular meeting is announced for January 21.

The firm of Craig & Martins, Sao Paulo, Brazil, has been dissolved, the interest of Julio Martin having been purchased by George Craig. Mr. Craig will continue the business of importing machinery and accessories under his own name and will maintain but one office instead of operating branch offices, as was done by the old firm.

Castings as Electrical Apparatus Parts*

Reasons for the Former Extensive Use of Iron and Steel—Suggested Remedies That May Be Applied to Check the Decline

BY A. B. REYNDERS†

The enormous growth of the present electrical industry is based upon the discovery of electromagnetic induction in the year 1831. Of all known materials suitable for making a magnet, iron and steel are the only ones commercially used for the magnets on electric generators and motors. For structural reasons iron and steel are also used but for this purpose they may be replaced by other material. In some cases, it is absolutely essential that iron and steel be not used in order that the activities of the magnets be confined to certain paths. Of all materials, however, it may be stated that without some revolution in the art, iron and steel will always have to be used in electrical machinery, although the particular form of this material will depend upon a number of conditions, such as cheapness, light weight, ease of fabrication, etc.

As the electrical art is much younger than foundry practice, it is but natural that in the early days electrical designers turned to castings as the most convenient means of obtaining their ends. Cast iron, lending itself to a multitude of shapes, was quickly adopted to form the field frame, or what is known now as the stationary part of direct-current machines. At first these were of simple types and contained but two poles, but later they were modified to contain many poles and this required what is known as multi-polar type field castings. For structural reasons, such as stiffness of frame, lightness of bearing, etc., a greater amount of metal was used than was required for electrical reasons. As the art progressed, it was found that cast-iron poles caused a certain loss impossible to correct by this method of construction and the next step was to make them out of higher grade material, wrought iron being employed. It was found that if this iron was divided into very thin plates these losses were still further reduced so that the logical step was to make poles composed of a lot of thin rolled steel plates and cast them in with the frame which still remained cast iron.

Owing to the progress made in steel castings and its superior magnetic qualities, the next step was the substitution of cast steel for cast iron in the frames. This represents the progress made to date with the exception that frequently for both electrical and mechanical reasons the poles are made of laminated material bolted or otherwise fastened in the cast steel frame.

The development of the revolving part of direct-current machinery was quite similar to that of the stationary part. First, a solid core was used, followed by a shaft with a lot of thin disks clamped together. Later the disks were slotted and the wires placed therein, while at the present time and particularly on large machines the laminated part is retained, but is built on a cast spider through which the shaft passed. It is thus apparent that cast steel forms a large portion of the tonnage used in electrical apparatus.

With few exceptions malleable iron has not been used for the magnetic circuits in electrical machinery. This is due principally to the fact that it does not possess as good magnetic qualities as steel, though it is better than cast iron, and requires a much longer time to obtain it from the foundries.

Owing to the large energy losses in alternating-current machinery, the field or stationary part has to be treated the same as the revolving parts; that is, laminated or built up of thin steel sheets. Owing to the lack of mechanical strength of such a design, a retaining structure is provided which may consist of a casting.

In addition to the iron and steel castings, where a large number of parts requiring greater strength than cast iron and steel are necessary, malleable iron is used, especially where these parts are small. Quite a number of spiders are used in the production of railway motors, bushings for commutators used on industrial apparatus, levers and numerous other small items, all of which are made from this material. Alloy castings, such as the ordinary brass, magnalium metal, resistance material, etc., are used each to perform a certain required function. The Westinghouse Electric & Mfg. Company purchases all of its steel and malleable iron, but makes all of its iron and alloy castings in its own foundries.

In the old days railway motors were made of cast iron. To-day the frames are made of steel, while the revolving parts contain laminated steel, malleable iron and of course the necessary amount of copper, insulating material, etc. Railway motors are usually made in large quantities, and the steel foundries consider the obtaining of an order for these castings quite desirable. The modern tendency toward weight reduction in railway apparatus follows very closely that for all lines of electrical apparatus, except that it is more pronounced, great insistence being placed within the last year or two upon light weight motors. Unfortunately, the demands to secure light castings have not met with very great success on the part of the foundries. It may be unjust to accuse them of the short-sighted policy of negligence in attempting to reduce their requirements as to thickness of section in making these castings. It may be stated, however, that unless more success is obtained in reducing these thicknesses, the foundries will force the electrical manufacturer to some other form of steel. At the present time this company has developed and has shown to the public a pressed steel type of railway motor, the greatest advantage of which is light weight and uniform material. This means that the steel foundries will obtain less and less business, and it therefore behooves them to investigate carefully methods of casting which will allow them to reduce thicknesses to the minimum requirements of electrical and mechanical designs. A greater uniformity in weights must also be maintained.

In the manufacture of large, direct-current machinery, steel is rapidly replacing iron, especially when speeds and consequently mechanical strains are high. In the old days, when slow-speed engines were used for prime movers, generators were large in dimensions, and the frames were usually of cast

*From a paper read before the Pittsburgh Foundrymen's Association, December 7, 1914.

†Director of production, Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

iron. With the advent of modern high-speed alternating-current turbo-generators, cast iron became unsuitable except merely as a retaining shell to hold higher grade material.

In the case of the revolving element steel has been used exclusively, but either in the form of a forging or else a specialty heat treated casting. This part is usually known as a disk and consists mainly of a large cylinder, sometimes with the shaft ends cast thereon and at other times not. From the standpoint of the foundry which has not had experience with the manufacture of this solid steel cylinder, this business appears to be highly desirable and easy to manufacture. Although a simple casting, the rigid requirements are such that only after a large experience can such castings be profitably produced.

Whenever it is desired to obtain small castings, particularly of steel, the question of sections is of vital importance. Owing to its higher magnetic qualities, steel would be used in many more cases if the section of the metal could be reduced and a uniform, clean casting secured. For example, take light steel castings commonly used for the lighting generators on automobiles. If a section of ⅛ or even ¼ in. could be obtained, it is probable that cast steel would be employed, but as it is the tendency in the design is toward the use of a forged frame, the reason being that the machine will be considerably lighter and the performance more uniform. For starting motors in which the mechanical requirements predominate, it is found that malleable iron will give sufficient magnetic performance and owing to the fact that it is cheaper and the weight is considerably less than steel, due to its small section, it is being used at present. In the case of lighting generators, where the magnetic material must be of the highest quality, cast steel is being used or else forged steel frames. Here again, due to inability to cast small sections, the tendency is away from steel castings. Even malleable iron which is cheaper than steel cannot compete the forging either in price or in quality.

It is needless to say that in all of these small steel castings freedom from hard spots and sandy surfaces is essential. Otherwise the amount of material allowed for finish is greatly increased. This results in an increase in weight and immediate investigation will be made toward the use of other materials tending to a reduction in price and weight.

In the foregoing, little has been said regarding deliveries. Ofttimes the material used in the design is determined upon the ability to procure it quickly. In such cases malleable iron generally suffers, cast iron getting the preference. Competition in the delivery of electrical apparatus is so keen that it is essential whenever malleable iron is used either to carry a stock or else take the chance of losing the job. On steel, fairly quick deliveries can be obtained by pressure.

In the numerous cases that have been taken up all concern the outside foundries. Cast iron and the various alloys are made in the Westinghouse foundry and similar requirements as to weights and sections exist and in general are being met. Cast iron may now be said to be limited practically to the requirements from a mechanical standpoint and it is rarely used for the magnetic circuit.

To draw a few conclusions it may be said that as a general proposition the use of castings in the production of electrical apparatus is diminishing and, in order that this state of affairs may not be further augmented, it behooves the foundries to make improvements in their products. Electrical business demands soft light weight, clean castings, and the penalty for failure to meet these requirements is the falling off in business and the turning to other grades of material, particularly pressed steel.

Westinghouse Electric Relief Department

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has issued a preliminary statement of its sickness and accident relief, accident compensation and service pensions on which its officers have been working for over a year. The plan includes three separate and distinct features: 1. Extension of the present relief department. 2. An accident and compensation plan. 3. Service pensions.

The privileges of the Relief Department are open to every employee, regardless of sex, age, position or location, upon payment of small monthly dues. The company pays the entire expense connected with the operation and maintenance of this department, the dues being reserved wholly for the payment of benefits (proportioned to wages) for sickness and accident arising from causes other than employment. In the event of death the amount paid from the dues will be duplicated by the company, which will also meet any deficit that may arise. Benefits will continue as long as disability lasts, or until the age of 70 years is reached, when pensions will then be granted.

The accident compensation fund is maintained entirely by the company for the benefit of all employees, male or female, whether they belong to the Relief Department or not. This plan covers the payment for disability due to accident, or for death resulting from accident, while at work as an employee, and makes provision for both total and partial disability. In case of total disability the company will pay as long as the disability lasts, even for life, two-thirds of the average wages received, and for partial disability two-thirds of the reduction in the earning capacity of the employee, even though the employee should eventually leave the service of the company. In case of death, the company will immediately pay the dependents or next of kin $150, as explained under the provisions of the plan as a pension to the widow or dependent husband or children under 16 years of age. Medical, surgical and hospital expenses under the direction of the company's medical officers will be paid during disability from such accidents.

Employees of the company shall be retired at the age of 70 years, and those who at the time of such retirement are members of the Relief Department, and have completed at least 20 years of continuous service, are to be granted a pension amounting to 1 per cent. of the average monthly wages during the last 10 years of employment for every year of continuous service, with a minimum of $20 per month and a maximum of $100 per month. Upon the death of the pensioner, one-half of the pension will be paid to the widow until remarriage, providing marriage occurred at least 10 years before the granting of the pension. For the support of each child under 16 years of age, and for each wholly dependent grandchild under 16 years of age, one-fourth of the pension will be paid until they reach the age of 16 years.

The president may, at his discretion, retire any employee between the ages of 60 and 70 years who has been in the service the required time, and he may increase any pension for specially meritorious service by 25 per cent., but not beyond the maximum pension of $100 per month.

In those States already having workmen's compensation laws, as in the case of New Jersey and Ohio, where the company also maintains plants, such laws may be substituted in whole or in part. Where the provisions of the Westinghouse plan are more liberal, these will generally prevail.

The Bucyrus Company, South Milwaukee, Wis., has booked an order for two 150-ton railroad wrecking cranes for a large Eastern system for February delivery.

ESTABLISHED 1855

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Steadying Effect of Carrying Stocks

It is a commonly accepted theory in the study of markets for commodities that the carrying of stocks tends to steady prices; that commodities that can be carried in stock are as a rule subject to less violent fluctuations than those that must pass directly from production to consumption.

The common experience of the steel trade suggests a modification or rather a limitation to this theory, that for the steadying effect to be realized the stocks must be carried by sellers and not by buyers and that, indeed, the carrying of stocks by buyers tends to make the market fluctuate.

As a matter of fact, the carrying of stocks of steel by jobbers and consumers, or rather the ability to carry stocks or not to carry them, according to choice, is one of the important influences that cause the wide fluctuations to which steel prices are notoriously subject. Under normal conditions the buyers of finished steel, on the whole, carry large stocks, to the extent of several millions of tons in the aggregate. Rails are not stocked, and plates and shapes are stocked only to the extent of a small percentage of the total production. But bars, pipe, sheets, wire, hoops, etc., are stocked very largely by jobbers, retailers and manufacturing consumers. The last named constitute a large class, members ranging from the large manufacturing establishments down to the country blacksmith.

When the steel market is engaged in one of its upward swings two things confront the buyer of finished steel products—that prices are going to be higher in future and that deliveries are going to be slower. Both these influences move him to buy more freely, thus encouraging the upward movement. When the top has been passed, precisely the opposite conditions come into prospect, and the buyer naturally pursues the opposite course, restricting his purchases and thus aiding in the downward trend as he had previously encouraged the upward movement.

This influence upon the steel market, of buyers alternately increasing and decreasing their stocks, is one that is well recognized by market students, and is always referred to when great market movements are discussed. It readily can be seen that if the seller instead of the buyer were in the habit of carrying stocks the market fluctuations would be reduced instead of increased. That the manufacturer as a rule cannot carry stocks of any consequence is due to the expense of maintaining warehouses and rehandling the material, as well as to the important fact that nearly all steel products are made to specification, and the mill cannot anticipate the specifications with certainty.

The steel trade furnishes from within itself some suggestions as to how the carrying of stocks by buyers tends to cause wide market fluctuations, while the carrying of stocks by producers tends to reduce fluctuations. Rails may be a poor example, as this commodity is a law to itself, but it will do no harm to recall the fact that rails are not stocked to any extent by either seller or buyer, and the price has not changed for more than 13 years. Sheets, which cannot be stocked by the average producer to any extent, but are stocked quite largely by buyers, have shown wide price variations, the widest perhaps of any of the common steel commodities. In the past five years the average difference between the high and low price each year has been $7 a ton. In bars, which are stocked freely by many buyers, the average divergence has been $4. In steel pipe, which is stocked by producers as well as by consumers, the average divergence has been only $3.60, or about half as much as in sheets. In wire nails the average of the paper fluctuations has been $5 a ton, but the top prices in wire are rarely paid, so that the actual fluctuations have averaged not much above $3 a ton, the highest price actually paid in any given year of the past five averaging only about $3 a ton more than the lowest price paid in the same year, and nails are a commodity freely stocked by the producers, so that the relative smallness of the fluctuations is significant.

It might be of advantage to steel producers to consider whether they cannot carry stocks to a greater extent than has been customary. It will probably be admitted that in years gone by producers were not averse to these fluctuations, on the ground that they made money in the boom periods; but of late the rises have been much less profitable and the depressions correspondingly more oppressive. It costs money to stock finished product, or to stock ingots or pig iron, on account of the reheating then necessary; but in the past the steel interests have carried large stocks of ore in many instances when the gain thereby was not particularly apparent. If the sales and operating departments could get together on a plain business basis something might be accomplished, the operating department determining how much it costs per ton to carry a given stock and the sales department in turn endeavoring to figure out how much might be gained in a market way by carrying the stock.

International Competition in Steel

The European war has already made certain so many momentous changes in international relations that its effect upon agreements in the steel trade becomes of minor consequence. Yet the sweeping away of the arrangements between producers in various European countries on steel rails, semi-finished steel and structural shapes, and the more restricted agreements on some other products inevitably suggests the demoralization that will long mark the international steel trade, affecting neutrals as well as belligerents. There has been some jumping at conclusions, both in England and the United States, as to the new export opportunities opened up to iron and steel manufacturers. But the early confidence with which outer markets heretofore largely supplied with German steel were to be captured by British makers and the equal confidence of predictions of greater markets for American steel at the expense of all the western European belligerents have disappeared. The sobering fact in all efforts to determine the future course of the steel trade is the tremendous blow the war is dealing to the world's buying power.

There is the view that reconstruction will make large demands upon iron and steel works, and that therefore these industries in each country will be occupied largely with domestic needs. On the other hand, the great drain upon the finances of the warring countries and the desperate necessity of their repair, by putting industrial plants quickly at work after the war, may make such countries dangerous competitors for international business in those lines in which their costs are lowest. Germany in particular may become an uncomfortable competitor of our own steel makers for business on both our seaboards.

The probable remoteness of the ending of the war by no means removes the question of European competition in the American market from the field of practical discussion. The war found the United States unprepared to cope with the problems of ocean commerce, and that handicap is working against our industries every day. It will be only adding folly to that neglect if no steps are taken to amend the present tariff law against the coming on of the later war in which European steel works will bombard with new low prices the best market in the world.

An Achievement for 1915

Conditions appear to be most promising for substantial progress in the great work of building up our merchant marine. It has been many years since the sentiment in favor of the expansion of our ocean carrying trade has been so widespread and has exhibited such strength. This feeling is no longer confined to interests either directly connected with shipbuilding or located immediately along the seaboard. The necessity of having our own ships on the ocean has been driven home to people who were either indifferent to this matter or openly hostile to any propositions offering encouragement to shipping. Western farmers have realized through the almost complete cessation of grain shipments in the early stages of the European war how important ocean transportation is to their welfare, while Southern cotton planters have been more seriously felt the result of a lack of ocean vessels carrying the United States flag. They have learned from severe experience that this is a question affecting vastly more interests than those connected directly with the shipping and shipbuilding business.

The steps which have been taken toward reviving our merchant marine have simply been preliminary. It is true that we now have a great deal more tonnage under the flag of the United States than was the case at the time the European war broke out. This tonnage, however, is insignificant as compared with what such a country as the United States, with its vast incoming and outgoing foreign trade, should possess. Our merchant marine should rank above that of Germany and should rival, if not surpass, that of Great Britain itself. United States ships should sail every ocean and be regularly found in every seaport of consequence throughout the world. Not a country with an ocean front is to be found that does not send some portion of its products to the United States and there are few to which some of the commodities produced here do not make their way. It has long been the shame of this country that the products of the United States have been obliged to depend on foreign vessels to reach distant markets. The beginning made in the year just ending is an important step in the right direction, but much ground remains to be covered.

This is a most inviting field for the attention of Congress, and it is earnestly hoped that the coming year, if possible the opening months of the year, may find measures brought forward which will not only lay broad and deep the foundations for an enlarged merchant marine, but which at the same time will be based on principles that will command the hearty support of all political and business interests. President Wilson has shown that he is deeply interested in this matter, and he undoubtedly desires his Administration to win the credit for the reawakening of interest in ocean transportation. In this he will have the powerful assistance of Senator-elect Underwood, who expressed himself vigorously on this subject in a public address in Brooklyn last July, and who is the author of the provision in the present tariff bill discriminating in the duty on imports when brought here in United States vessels. It will be embarrassing for Western and Southern Congressmen to go back to their people and explain their actions, if they do not at this session of Congress assist by all means in their power in the adoption of legislation of the most substantial sort intended to encourage our merchant marine. To effect such legislation would be an achievement of the highest order for the political party now in power, while it would be an act of patriotism for the minority to assist in such legislation, notwithstanding political differences.

The manufacturers and merchants of this country are deeply interested in the question of increasing our exports. They hope most earnestly that every advantage may be taken of the present dislocation of foreign trade with some of the more important manufacturing countries of the world to turn these developments in our favor. This will be greatly assisted by the building up of our merchant marine and the establishment throughout the world

of influences operating in favor of the United States. Hand in hand with legislation for the encouragement of our shipping interests should be further legislation permitting our railroads to make special rates on products routed for export and also permitting combinations of manufacturers and other producers for the purpose of assisting in the development of an export trade. It will be necessary for broad views to prevail with regard to these matters, if the people of this country are to reap all the advantages they should from efforts for the extension of our foreign commerce.

CORRESPONDENCE

Railroads Now Expected to Do Their Part

To the Editor: There is another side to the railroad rate decision which has not been touched on to any great extent. An immense amount has been said in regard to the needs of the railroads and the absolute necessity of providing them with increased revenues. That argument prevailed with the Interstate Commerce Commission. It took a long time for the commissioners to see the point, but after many months of procrastination their eyes were opened. Now there is a distinct responsibility on the part of the railroads. Sentiment has been greatly changed, and the prospects are that there will be still more change, so that the railroads shortly will be in a position to carry out their plans for much needed improvements. But the responsibility has been shifted from the Interstate Commerce Commission and the public at large, so to speak, to the railroads. It is now their turn to do their part.

The way to resume is to resume, and the way to do business is to do business. It is up to the railroads to start to do business. It has been said on credible authority that the desks of railroad purchasing agents are stacked high with specifications for new equipment and material of one kind or another, and that the orders have not been placed because of the lack of money. If these purchasing agents are now given instructions to place these orders it would not take long to alter business conditions decidedly for the better. The responsibility is right up to the railroads; they have been helped and it is time now for them to help others.

MANUFACTURER.

Railroad Warehouse and Lighterage Charges at New York

Notices were recently sent out by the railroads having docks in and around New York City that the allowance of 10 days' warehouse storage without charge which has been regularly given to shippers would be cut down to 48 hours. Protests were made to the Interstate Commerce Commission, by shippers, particularly in the export trade, the Merchants' Association of New York taking up the matter actively. An order has been issued by the commission suspending the new regulation until May 1, 1915, pending investigation and hearing. The proposed changes were part of a new schedule the railroads had prepared in accordance with the suggestions of the Interstate Commerce Commission decision of July 29. These included new lighterage charges averaging about 12 cents per ton for services now rendered free; also changes in the rules affecting private terminal and receiving stations in and about New York harbor. All have been suspended until May 1.

An improved method for the determination of nitrogen in steel is published by L. E. Barton, of the Titanium Alloy Mfg. Company, in the December issue of the Journal of Industrial and Engineering Chemistry.

Steel Warehouse and Fabricating Shop at Galveston, Texas

Texas Carnegie Steel Association completed some time ago at Galveston, Texas, and is now operating a warehouse for the storage of steel products, having in conjunction with it a fabricating shop. The buildings, which cover 250 x 325 ft., are located at the head of slip B at the Southern Pacific docks. There are two warehouse units, each 100 x 250 ft., of steel frame, peak roof construction and covered with corrugated sheathing. One is used for bar storage and the other for the storage of structural steel. A third building, 125 x 250 ft., is used as a fabricating shop. The warehouse units are each spanned with a 10-ton electric traveling crane, 95 ft. from center to center of track wheels. The fabricating shop is served by two cranes of 10 tons capacity each, having a span of about 60 ft. Practically all the material received comes to Galveston by water and is unloaded at the warehouse directly upon narrow gauge buggies, the rails for which extend from the edge of the handling apron through the centers of the three buildings at right angles to the travel of the cranes. Alongside the railroad track and extending the length of the buildings is a space 20 ft. wide reserved for making up shipments which are to go by rail. This shipping wharf is supplied with two lines of narrow gauge tracks equipped with 20-ton track scales. Shipments to go by motor truck or wagon are loaded direct by crane.

In the fabricating shop each machine has its individual motor directly connected. Safety features include inclosure of gears, flywheels and dangerous moving parts. There are push button operated motor starters with dynamic braking wherever it is advisable to bring machines, particularly of the flywheel type, to rest within a few seconds. For cutting material to length a heavy mill type bar shear with 18-in. knife is provided and a plate shear with capacity to shear a 72 x 1-in. plate. This machine is designed with a 24-in. gap so that plates may be split or side sheared. A seven-spindle twisting machine is employed for concrete reinforcing bars. It is driven by a powerful mill-type motor. Structural shapes are cut to length by a 24-in. friction saw, the roller table for which is 100 ft. long. An angle shear is 6 x 6 x ¾ in. capacity. Other equipment of the fabricating shop includes a double beam punch, a coping machine, a punch with 48-in. gap, a 36-in. rotary planer and a gag press for bending and straightening. There are also a 24-in. lathe, a 20-in. shaper, a high duty drill press, a boring machine, motor driven emery wheel, a 1½-in. double head screw cutting machine, and there are horseshoe and compression type machine riveters. Oil-burning furnaces are used for heating steel.

Owing to the climate special attention has been given to ventilation in the design of the warehouse, and there are windows of continuous and swinging steel sash in addition to skylights and monitor lights. The windows are of wire glass. For artificial illumination high-power Mazda lamps have been provided.

A 25-ft. depth of water is maintained alongside the handling apron, while at each end of the buildings railroad tracks give direct connection within the terminal yards of the Southern Pacific Railroad.

C. N. Markle is president of the Carnegie Texas Steel Association, which is not incorporated, and F. B. Markle is vice-president.

Russian Iron Output Cut Down

At the close of September the large iron and copper works of the Ural mining industries in Russia were still working, according to the British vice-consul at Ekaterinberg, although in many cases the production was smaller than the average. Scarcity of labor was causing difficulties in the mining of sufficient ore. Coke had ceased to be received from Germany and although it was rumored as being imported from Great Britain via Archangel, its scarcity was pronounced, especially because the Donetz coke producers in the south of Russia were unable to deliver their product owing to poor railroad service.

Ferromanganese Embargo Continues

WASHINGTON, D. C., December 28, 1914.—A serious hitch has developed in the negotiations for an agreement with Great Britain under which importations of ferromanganese from England and manganese ore from India, placed under embargo sometime ago, may be resumed. As stated in *The Iron Age* a month ago, the Secretary of State, at the instance of President Farrell and Chairman Gary of the United States Steel Corporation, took the matter up with Ambassador Page at London, who, after a conference with the officials of the British Foreign Office, advised the State Department that a plan was under consideration in accordance with which American consumers of ferromanganese and manganese ore would be permitted to import these products freely from any port in Great Britain, or subject to British authority, conditioned upon a guarantee, based on a bond, that no part of such shipments would be subsequently re-exported in such a manner as to ultimately reach any of the countries now at war with Great Britain. Two ship loads of ore, consigned to the United States and detained at Bombay, were released by special order of the British Foreign Office without waiting for the completion of the proposed arrangement.

While the State Department officials limit themselves to the statement that "the department has no news from Ambassador Page with regard to the manganese embargo," unofficial advices received here from London indicate that the British Foreign Office has indefinitely postponed the arrangement referred to by the American ambassador and that the reason for the failure to adopt the plan and put it into force is the fear of the British Government that, no matter what safeguards are utilized, the enemies of Great Britain will directly or indirectly be benefited by the lifting of the embargo. It is understood that the British Government makes the point that it is immaterial whether manganese and manganese ores of British origin are shipped from the United States to Germany or whether war material, in the production of which manganese is used, is sent to German ports. In either event, it is contended, British interests would suffer and the continuance of the embargo is, therefore, justified.

With regard to Ambassador Page's assurances that an arrangement would soon be made for the lifting of the embargo, it is now understood that at the time the matter was first taken up the war was lagging and the allies were making gains. Recent developments, however, especially the German attacks on English coast towns, have greatly disturbed the British Government and there is a marked disposition to "take no chances." Indications are also in evidence here that the British Foreign Office is watching closely the development of our neutrality policy with reference to exports of munitions of war. More than one member of the diplomatic corps, stationed here, is said to have expressed gratification at the action of the Secretary of State in requesting Charles M. Schwab to abandon his plans for building submarines, but more recently these diplomats have received the impression that there has been a decided change in the State Department's policy. The later attitude is understood to be reflected in the declaration of Secretary Bryan that the Administration is not behind the movement in Congress, led by Senator Works of California, to forbid American citizens to ship war supplies to any of the combatants. This movement is based on the contention that if all the neutral nations should refuse to supply war material the war would soon come to an end, but that as long as ample war supplies can be had in the United States the conflict will continue indefinitely, as both Germany and the allies have enormous financial resources which have hardly yet been tested.

Notwithstanding the unfavorable outlook, the State Department has not abandoned hope of securing the lifting of the manganese embargo, and Ambassador Page is understood to be using every effort to obtain the agreement outlined in his dispatches to the department a month ago. Secretary Bryan and Solicitor Johnson are said to be specially interested in the matter, owing to the representations that have been made to them that, while the United States Steel Corporation has sources of supply in South America, the so-called independent producers are forced to rely almost entirely upon ferromanganese and manganese ore of British origin. W. L. C.

CONTENTS

Magnetic Skelp Charging Machine 1483
Small Self-Contained Planing Machine 1484
Carwheel Grinding Machine 1485
New Way to Make High Manganese Steel Castings 1485
A Motor-Driven Gun Boring Lathe 1486
An Adjustable Safety Saw Guard 1486
A New Type of Radial Drilling Machine 1487
The Armstrong-Whitworth Plant in Canada 1487
Locomotive Crane of Heavy Construction 1488
A New Hexagonal Guide for Screw Plates 1488
New Disk and Surface Grinding Machine 1489
Pipe Drilling Machines 1490
Double-Piston Hand Hydraulic Pump 1491
A Pyrometer Using Metallic Salt Pastes 1491
Brass Melting in an Electric Furnace 1492
German Steel Works Union on Trade Conditions 1495
Castings as Electrical Apparatus Parts 1496
Westinghouse Electric Relief Department 1497
Steadying Effect of Carrying Stocks 1498
International Competition in Steel 1499
An Achievement for 1915 1499
Correspondence 1500
Railroad Warehouse and Lighterage Charges at New York 1500
Steel Warehouse and Fabricating Shop at Galveston, Texas 1500
Russian Iron Output Cut Down 1500
Ferromanganese Embargo Continues 1501
Brass Manufacturers' Annual Meeting 1501
The Iron and Metal Markets 1502
German Steel Works Union's Fiscal Year 1512
Obituary 1513
German Iron and Metal Trades 1513
Very Important Statistics 1514
Pittsburgh and Nearby Districts 1514
Customs Decisions 1515
Southern Pig-Iron Rates 1516
Standard Old Metal Classification 1516
Penn Metal Company Absorbs Eastern Expanded Metal Company 1517
Electric Drive in the Navy 1517
Personal 1518
Falling Off in Manganese Ore From India 1518
Chattanooga By-Product Coke Ovens 1518
The Machinery Markets 1519
New Form of Foundry Tumbling Barrel 1525
A Grinding Attachment for Die Chasers 1525
Reinforced Concrete Factory Buildings 1525
Heavy Grinding Machine 1526
Harmony Club of the Osborn Company 1527
Floor Surfaces in Fireproof Buildings 1527
Quick Change Sensitive Drilling Machine 1528
A New Style of Rack Cutting Machine 1528
New Type of Foundry Flask Bar 1529
New Universal Internal Grinding Device 1529
Methods for Local Case Hardening 1529
Trade Publications 1530
Iron Ore in the Philippines 1530

Brass Manufacturers' Annual Meeting

The National Association of Brass Manufacturers held its annual meeting at the Hotel Biltmore, New York, December 9 and 10. Topics of interest to the trade were discussed and the meeting was pronounced one of the most profitable thus far held. The final report of the List Committee was acted on with instructions to issue the official catalogue January 1. Memorial resolutions on the late Joseph H. Glauber were adopted. Certain matters brought about by changed conditions in the various parts of the country were taken up and a committee was appointed to adjust them.

The following officers were elected: President, C. C. Hale; commissioner, William M. Webster. Trustees, C. C. Hale, New Haven, Conn.; J. M. McDonald, Dubuque, Iowa; A. S. Hills, Haydenville, Mass.; C. R. McCanna, Burlington, Wis.; C. H. Downs, Springfield, Mass.; Adolph Mueller, Decatur, Ill.; Theodore Ahrens, Pittsburgh, Pa.; Harold Wolff, Chicago, Ill.; E. L. Strauss, Cleveland, Ohio. Representatives to National Committee: A. C. Cogswell, Detroit, for the East, and E. F. Niedecken, Milwaukee, for the West. The spring meeting will be held in Detroit on March 17 and 18, 1915.

The Iron and Metal Markets

AN ADVANCE OF $1 A TON

Bars, Plates and Shapes 1.10c. Pittsburgh

Railroad Demand Has Not Developed, But Promises to Be Larger in January

The main development of the last week of 1914 is the action of a number of manufacturers of bars, structural shapes and plates in advancing prices from 1.05c., Pittsburgh, on early deliveries, to 1.10c. One independent bar interest made the advance last week. On Wednesday, December 30, the Carnegie Steel Company withdrew 1.05c. quotations and announced as its minimum prices on the three products, 1.10c. for first quarter and 1.15c. for second quarter. Two independent producers in these lines are reported to have taken a similar stand this week, and the indications are that the 1.05c. price is not being carried into the new year.

The amount of first quarter contracts booked at 1.10c., on which readjustments would be necessary if any lower price prevails on current business, is a strong incentive to sellers to hold the new minimum.

Interest has naturally centered, apart from that taken in this price movement in three market staples, in the outlook for railroad buying. Thus far there is no sign of the extent to which railroads will depart from the policy of buying for urgent needs. Rail orders were placed early this year; similar orders are likely to come out early in 1915. The Pennsylvania and the B. & O. are expected to buy soon. Some Eastern lines gave 1914 rollings on rails that will not be needed until next spring. The aggregate of track supplies soon to be required is considerable. One Eastern rail mill has booked 8000 tons in the past week and other Eastern rail inquiries are pending, including 4500 tons for the Boston & Albany.

Due to reduced railroad traffic and the fact that new cars can be had in six weeks, there is no hurry to place car orders, but a few roads are looking up their needs. Prominence has been given in this connection to the Pennsylvania Railroad's probable requirements of 9000 cars of various types. The Illinois Central is still negotiating for 1000 refrigerator cars.

December bookings of all independent steel companies have been considerably larger than those of November, though few reached the 100 per cent. rate of gain reported by the Steel Corporation for the first three weeks of this month, that being apparently due to the inclusion of some special contracts with extended deliveries.

The rate of mill operations in early January will show a moderate increase upon the December average. Actual consumption is little changed, but specifications have come in better of late on low-priced contracts running out with December. Predictions range from 50 to 65 per cent. as the probable operation by the end of the first quarter.

Foreign barb wire demand is hard to measure. Probably 75,000 tons of what is talked about is actually wanted, much of it for Great Britain. Further large inquiries for shrapnel bars have also come up. Russia is in the market for 2300 tons of cold-rolled strip.

In the wire trade recent low prices are made to apply on contracts covering in some cases the entire first quarter. In keenness of competition wire products and sheets have had special distinction.

December inquiry for cast iron pipe coming from gas and water companies and other private buyers has been the largest for that month since 1906. Low prices have been the stimulant. Baltimore has just bought 7400 tons and Chicago 7500 tons. Cincinnati will take bids on 2400 tons and Boston on 3800 tons.

Pig iron buying is still going on in the Central West after subsiding first in the East and then in the South. A gradual increase in blast furnace operation is probable in the new year. Wherever furnaces have taken on tonnages filling them up for several months, they have advanced prices, but the gain has not been general. Most middle Western furnaces will run through the first quarter on sales barely showing a profit.

The British embargo on ferromanganese shipments, from latest information, is not likely to be lifted, even under guarantees. Some uneasiness is again felt in this market as to the effects of this continued holding up of the British supply.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Dec. 30, 1914.	Dec. 23, 1914.	Nov. 25, 1914.	Dec. 31, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia....	$14.25	$14.25	$14.50	$15.00
No. 2, Valley furnace....	**13.00**	12.75	12.75	13.00
No. 2 Southern, Cin'ti....	12.40	12.40	12.90	13.75
No. 2, Birmingham, Ala..	9.50	9.50	10.00	10.50
No. 2, furnace, Chicago*	12.75	12.75	12.50	14.00
Basic, del'd, eastern Pa..	13.50	13.50	14.00	14.00
Basic, Valley furnace...	12.50	12.50	12.40	12.50
Bessemer, Pittsburgh....	14.70	14.70	14.70	15.15
Malleable Bess., Ch'go*.	12.75	12.75	12.75	14.00
Gray forge, Pittsburgh..	13.45	13.45	13.40	13.90
L. S. charcoal, Chicago..	15.75	15.75	15.75	15.25
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh..	19.00	19.00	19.00	20.00
O.-h. billets, Pittsburgh..	19.00	19.00	19.00	20.00
O.-h. sheet bars, P'gh...	20.00	20.00	20.00	21.00
Forging billets, base, P'gh.	24.00	24.00	24.00	24.00
O.-h. billets, Phila.....	21.40	21.40	21.40	21.50
Wire rods, Pittsburgh...	25.00	25.00	25.00	25.00
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	**11.25**	11.00	11.00	13.00
Iron rails, Philadelphia..	13.00	13.00	13.00	15.50
Carwheels, Chicago	9.75	9.75	9.50	11.50
Carwheels, Philadelphia.	**10.50**	10.25	9.50	12.00
Heavy steel scrap, P'gh.	**11.25**	11.00	10.00	10.50
Heavy steel scrap, Phila.	9.50	9.50	9.25	10.00
Heavy steel scrap, Ch'go	**8.75**	8.50	8.00	9.00
No. 1 cast, Pittsburgh...	11.25	11.25	10.50	10.75
No. 1 cast, Philadelphia.	**11.75**	11.50	11.00	12.00
No. 1 cast, Ch'go (net ton)	9.25	9.25	8.50	10.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.17½	1.17½	1.12	1.22½
Iron bars, Pittsburgh....	1.15	1.15	1.15	1.35
Iron bars, Chicago.....	0.95	0.95	0.95	1.10
Steel bars, Pittsburgh....	1.05	1.05	1.10	1.20
Steel bars, New York....	1.21	1.21	1.26	1.36
Tank plates, Pittsburgh.	1.05	1.05	1.05	1.20
Tank plates, New York..	1.21	1.21	1.26	1.36
Beams, etc., Pittsburgh..	1.05	1.05	1.10	1.20
Beams, etc., New York..	1.21	1.21	1.26	1.31
Skelp, grooved steel, P'gh	1.10	1.10	1.10	1.20
Skelp, sheared steel, P'gh	1.15	1.15	1.15	1.30
Steel hoops, Pittsburgh..	1.20	1.20	1.25	1.35

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Dec. 30, 1914. Cents.	Dec. 23, 1914. Cents.	Nov. 25, 1914. Cents.	Dec. 31, 1913. Cents.
Sheets, black, No. 28, P'gh	1.80	1.80	1.85	1.85
Galv. sheets, No. 28, P'gh	2.75	2.75	2.85	2.85
Wire nails, Pittsburgh	1.50	1.50	1.55	1.55
Cut nails, Pittsburgh	1.50	1.55	1.60	1.55
Fence wire, base, P'gh	1.30	1.30	1.35	1.35
Barb wire, galv., P'gh	1.90	1.90	1.95	1.95
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$1.50	$1.50	$1.50	$1.85
Furnace coke, future	1.75	1.75	1.75	2.00
Foundry coke, prompt	1.90	1.90	1.90	2.50
Foundry coke, future	2.15	2.15	2.15	2.60
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.50	13.50	12.62½	15.12½
Electrolytic copper, N. Y.	13.00	13.25	12.50	14.87½
Spelter, St. Louis	5.40	5.50	5.15	5.20
Spelter, New York	5.55	5.65	5.30	5.35
Lead, St. Louis	3.62½	3.65	3.77½	4.10
Lead, New York	3.80	3.80	3.90	4.15
Tin, New York	33.25	33.80	33.87½	37.37½
Antimony, Hallett's, N. Y.	14.00	13.50	15.00	7.00
Tin plate, 100-lb. box, P'gh	$3.10	$3.10	$3.15	$3.40

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal on plates, shapes, etc., is 46c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.05c. to 1.10c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.05c. to 1.10c.

Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.20
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.30; galvanized, $1.70. Galvanized barb wire and fence staples to jobbers, $1.90; painted, $1.50. Wire nails to jobbers, $1.50. Woven wire fencing, 73 per cent. off list for carloads; 72 off for 1000-rod lots; 71 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.45	$1.50	$1.55	$1.60	$1.70	$1.80	$1.90	$2.00
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Wire Rods.—Bessemer, open-hearth and chain rods, $25.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from November 2, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	74	53½	⅛ and ¼	66	47
½	78	67½	⅜	65	46
¾ to 3	81	72½	½	69	56
			¾ to 2½	72	61

Lap Weld

2	78	69½	1¼	56	45
2½ to 6	80	71½	1½	67	56
7 to 12	77	66½	2	68	58
13 and 14	63½	..	2½ to 4	70	61
15	61	..	4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	79	70½	1 to 1½, butt	70	59
2, lap	76	67½	2, butt	70	59
2½ to 6, lap	78	69½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	69	58½	⅜	63	52
½	74	67½	½	67	60
¾ to 1½	78	71½	¾ to 1½	71	62
2 to 3	79	72½	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	75	66½	1½	65	59
2½ to 4	77	68½	2	66	58
4½ to 6	76	67½	2½ to 4	70	61
7 to 8	69	58½	4½ to 6	69	60
9 to 12	64	53½	7 to 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	64	57½	½	57	49
¾ to 1½	67	60½	¾ to 1½	60	52
2 to 2½	69	62½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	65	58½	2	55	49
2½ to 4	67	60½	2½ to 4	60	54
4½ to 6	66	59½	4½ to 6	59	53
7 to 8	59	48½	7 to 8	52	42

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	62	1½ in.	45
2¼ in.	59	1¾ and 2 in.	49
2½ and 2¾ in.	65	2¼ in.	45
3 and 3¼ in.	70	2½ to 2¾ in.	54
3½ and 4½ in.	72	3 and 3¼ in.	57
5 and 6 in.	65	3½ and 4½ in.	60
7 to 13 in.	62	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points. On standard charcoal iron tubes for desirable orders the above discounts are shaded an extra 5, and occasionally two 5's by some makers.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, as follows, f.o.b. Pittsburgh, terms 30 days

net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 to 10	1.30 to 1.35
Nos. 11 and 12	1.35 to 1.40
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.45 to 1.50
No. 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.55 to 1.60
Nos. 17 to 21	1.60 to 1.65
Nos. 22 and 24	1.65 to 1.70
Nos. 25 and 26	1.70 to 1.75
No. 27	1.75 to 1.80
No. 28	1.80 to 1.85
No. 29	1.85 to 1.90
No. 30	1.95 to 2.00

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.75 to 1.80
No. 12	1.85 to 1.90
Nos. 13 and 14	1.85 to 1.90
Nos. 15 and 16	2.00 to 2.05
Nos. 17 to 21	2.15 to 2.20
Nos. 22 and 24	2.30 to 2.35
Nos. 25 and 26	2.45 to 2.50
No. 27	2.60 to 2.65
No. 28	2.75 to 2.80
No. 29	2.90 to 2.95
No. 30	3.05 to 3.10

Pittsburgh

PITTSBURGH, PA., December 29, 1914.

On Wednesday morning, December 30, the Carnegie Steel Company will send telegrams to all its sales agents stating that its minimum prices on plates, shapes and steel bars for first quarter will be 1.10c. and for second quarter 1.15c., f.o.b. Pittsburgh. The Jones & Laughlin Steel Company has sent all its sales agents a similar notification. Both companies will instruct their sales agents that under no condition are they to accept business at less than these prices. It is believed that other steel companies will take this action, and the market on plates, shapes and steel bars can now be stated to be on a 1.10c. basis for first quarter. The pig-iron market is dull. There has been some covering on sheet bars by sheet and tin-plate mills for first quarter on the basis of about $20, Pittsburgh, and $19, Youngstown. The most improvement has been in the scrap market, the demand for which is better at higher prices. It is claimed that selected heavy steel scrap has sold as high as $11.50, delivered to buyer's mill. The coke market is quiet, as most active blast furnaces are covered for first half.

Pig Iron.—Aside from some small buying in foundry iron, the local market is dull. Consumers of basic are covered through first quarter and first half, and there is very little inquiry. The Marshall Foundry Company, this city, sent out an inquiry last week for 3000 to 6000 tons of Bessemer for first quarter, but has not bought. Prices on foundry iron are slightly higher. We quote Bessemer iron at $13.75; basic, $12.50; malleable Bessemer, $12.75; No. 2 foundry, $13 to $13.25, and gray forge, $12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—Some independent sheet and tin-plate mills are covering their needs of sheet bars for first quarter on the basis of about $20, Pittsburgh. There is a fair demand for billets, including some inquiry from abroad. We quote Bessemer and open-hearth billets at $18.50, and Bessemer and open-hearth sheet bars $19, f.o.b. maker's mill; Youngstown; Bessemer and open-hearth billets, $19, and Bessemer and open-hearth sheet bars, $20, f.o.b. maker's mill, Pittsburgh. Forging billets are quoted at $24 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take $1 per ton extra. Axle billets are quoted at $21 to $22.

Ferroalloys.—There is practically no new inquiry for ferromanganese. Some steel works have fair sized stocks, the material having come in faster than it was used. No sales are reported in this market, and the nominal price of $68, seaboard, is still being quoted on English 80 per cent., subject to delay in delivery. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is $19; 11 per cent., $20, and 12 per cent., $21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Steel Rails.—As yet, the advance in freight rates granted to Eastern railroads has not resulted in any large rail orders. It is stated on good authority that early in January the Pennsylvania Railroad will buy 60,000 tons and the Baltimore & Ohio 40,000 tons. The 27,000 tons of standard sections for Norway were placed with German mills. The new demand for light rails is quiet, a good part of the business going to the rerolling mills, which are selling at about $1 per ton less than on rails rolled from billets. We quote standard section rails, made of Bessemer stock, at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots, 8 and 10 lb. sections, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c.

Structural Material.—A fair amount of small work is being placed, but large projects are still being held up. The McClintic-Marshall Company has taken 300 tons of shapes for Troop I Armory at Buffalo, N. Y., 1500 tons for new steel buildings for a pumping station at Cleveland, Ohio, and 850 tons for new buildings for the Pittsburgh Plate Glass Company, Clarksburg, W. Va. The Pennsylvania Railroad has divided some bridge work, 250 tons going to the Cambria Steel Company, 150 tons to the American Bridge Company, and 100 tons each to the Fort Pitt Bridge Works and the Riter-Conley Mfg. Company. Effective Wednesday, December 30, the Carnegie Steel Company and the Jones & Laughlin Steel Company's minimum prices on plates, shapes and steel bars will be 1.10c. for first quarter and 1.15c. for second quarter.

Plates.—The current demand is dull, but some large work is being figured on which it is believed will come out early in 1915. This includes five ore vessels and several tank steamers. It is reported that the Pennsylvania Railroad is making up requisitions for 9000 cars of various types. We quote ¼-in. and heavier tank plates for first quarter delivery at 1.10c., this being the minimum price named by the Carnegie Steel Company, Jones & Laughlin Steel Company and smaller mills.

Sheets.—A good deal of buying is in progress for prompt shipment and also for delivery in first quarter. Some of the larger makers are not anxious to sell for first quarter at present prices, and are doing so only when necessary to take care of regular customers. They believe that prices of sheets will be better early in the new year. Mill operations are improving, the American Sheet & Tin Plate Company operating this week to a little more than 60 per cent. and a few independent mills close to 75 per cent. We quote No. 28 Bessemer black sheets at 1.80c. to 1.85c.; No. 28 galvanized, 2.75c. to 2.80c.; Nos. 9 and 10 blue annealed, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Wire Rods.—Some inquiry from England is in the market, but no large lots are involved. A local company states it has sold since the war started more than 15,000 tons of rods for foreign shipment. Domestic demand is quiet, but some consumers are covering their needs for first half of 1915. We quote Bessemer, open-hearth and chain rods at $25, f.o.b. Pittsburgh.

Tin Plate.—Estimates now are that close to 85 per cent. of the tin-plate output for 1915 is under contract. A few large consumers have not yet covered, but contracts are being placed every day, and only in a few cases are deliveries limited to first half. Mill operations

are heavier than usual at this season because of the fact that shipments for the Pacific coast salmon trade are to go by way of the Panama Canal, and as delivery will thus take longer time the tin plate for these contracts is being rolled earlier than usual. This week the American Sheet & Tin Plate Company and some independent mills are operating to nearly 70 per cent. of capacity. We quote tin plate at $3.10 to $3.15 per base box on contracts, but for very desirable business the $3.10 price is shaded.

Shafting.—There is no betterment in demand. For current orders 67 per cent. off is quoted, but on a very desirable specification a larger discount would be made.

Nuts, Bolts and Rivets.—The market on nuts and bolts is pretty bady demoralized, prices being lower than for some years. Some makers are keen for business for delivery in first quarter and first half. Stocks carried by makers are heavy. The demand for rivets continues dull. We quote structural rivets at 1.35c. to 1.40c., and boiler rivets 1.45c. to 1.50c. in carload lots, small lots taking an advance of 5c. to 10c. There are no regular discounts in effect on nuts and bolts, each maker quoting whatever prices he sees fit to secure the order.

Skelp.—No foreign inquiry has come up for some time. Domestic demand is dull, as the pipe mills are doing very little. We quote: Grooved steel skelp, 1.10c. to 1.15c.; sheared steel skelp, 1.15c. to 1.20c.; grooved iron skelp, 1.50c.; sheared iron skelp, 1.50c. to 1.60c., delivered to consumers' mills in the Pittsburgh district.

Hoops and Bands.—Contracts are being made with large consumers for first quarter delivery at about 1.10c. for bands, with extras as per the steel bar card, and about 1.25c. for steel hoops, f.o.b. Pittsburgh. For prompt delivery these prices would be slightly shaded.

Wire Products.—An authority in the wire trade states that actual inquiries from abroad for barb wire aggregate 75,000 to 85,000 tons, and there is also some foreign inquiry for smooth wire and wire nails, mostly from England. Domestic demand for barb and fence wire is fairly active, but the wire nail season has not yet opened for spring delivery. It is stated that some makers are quoting $1.50 on wire nails for delivery within 60 to 90 days from date of order. We quote: Wire nails, $1.50; plain annealed wire, $1.30; galvanized barb wire and fence staples, $1.90; painted barb wire, $1.55, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. We quote steel cut nails at $1.55, f.o.b. Pittsburgh, in carload lots. We quote woven wire fencing at 73 per cent. off in carload lots, 72 on 1000-rod lots and 71 on smaller lots, all f.o.b. Pittsburgh.

Iron and Steel Bars.—A fairly heavy business in steel bars has been closed for first quarter at 1.10c., f.o.b. Pittsburgh, and more is under negotiation. It is still possible to get 1.05c. on steel bars for very prompt shipment but not for first quarter, and it is believed that very soon after January 1 the 1.05c. price will not be quoted. The new demand for common iron bars is dull and prices are weak. At the same time, mills rolling iron bars are not disposed to sell far ahead. We quote steel bars at 1.10c. for first quarter of 1915, and common iron bars, made from part scrap, at 1.15c., f.o.b. Pittsburgh.

Merchant Steel.—New demand has been dull, but betterment is looked for early next year. Prices are still more or less shaded on small lots for prompt delivery, being about as follows: Iron finished tire, ½ x 1½ in., and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ⅝ to ⅞ and 1 in., 1.80c. to 1.90c.; 1⅛ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Cold-Rolled Strip Steel.—The inquiry from Russia for cold-rolled strip steel is stated to be for 2300 tons, instead of 1200 to 1500 tons, as at first given out. The new demand is fair, but several makers are not anxious to sell far ahead at present prices. We quote cold-rolled strip steel as follows: Hard-rolled steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., $2.65 to $2.75 delivered.

Wrought Pipe.—Little has been done in the wrought-iron and steel pipe trade in the last half of December, but mills report that advices from sales agents indicate more activity in the pipe trade early in the coming year. An inquiry for 600 to 800 miles of 8-in. line pipe, to carry oil from Oklahoma to Port Arthur, Texas, is still very much alive, and it is believed this large contract may be placed early in 1915. Discounts on iron and steel pipe are quite firmly held.

Boiler Tubes.—The new demand for locomotive and merchant tubes is fair. Some heavy contracts for locomotive tubes have been placed for delivery in the first quarter. Discounts are still being shaded.

Old Material.—The demand from consumers is more active than for some time, and the market on some lines is higher. It is stated that $11.50 has been paid for selected heavy steel scrap delivered to consumers' mills in the Pittsburgh district. Dealers believe that shortly after January 1 there will be considerable new buying. For delivery to consumers' mills in the Pittsburgh and other consuming districts that take Pittsburgh freights, dealers quote as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.25 to $11.50
Compressed side and end sheet scrap	10.00 to 10.25
No. 1 foundry cast	11.25 to 11.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.25 to 9.75
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.00 to 10.25
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	13.25 to 13.50
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	9.75 to 10.00
No. 2 busheling scrap	6.00 to 6.25
Machine shop turnings	7.75 to 8.00
Old carwheels	10.75 to 11.00
Cast-iron borings	8.25 to 8.50
*Sheet bar crop ends	11.00 to 11.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

Coke.—Practically all the blast-furnace companies whose stacks are active have covered their requirements for first half, and some through all of 1915, and the market is quiet. There is no demand for prompt furnace coke, and not much doing in foundry. We quote standard makes of blast-furnace coke for prompt shipment at $1.50 to $1.60, and on contracts for first half and through all of 1915 at $1.75 per net ton at oven. Standard makes of 72-hr. foundry coke are held at about $2 for prompt shipment and $2.15 to $2.25 per net ton at oven on contracts. The Connellsville Courier reports the output of coke in the upper and lower Connellsville regions for the week ended December 19 as 198,533 net tons, an increase of 2258 tons over the previous week.

Chicago

CHICAGO, ILL., December 29, 1914.

The customary suspension of business activity at this season may be responsible for the postponement of that tangible improvement upon the hope of which the more cheerful market sentiment is founded. For the most part December bookings run ahead of November but the increase at no time has been sufficiently marked to indicate any change of policy by consumers and the average price of steel products is probably lower now than at any time previously. There is as yet no evidence that the railroads will depart in 1915 from their practice of buying only for urgent needs. Rail requirements are neglected, the one inquiry for 1000 cars suggests no unusual desire for an early closing, and the only railroad buying in the past week of any consequence is limited to the purchase of bars, including about 1000 tons of reinforcing steel. In the immediate environs of Chicago the very low prices for plates, shapes and bars continue to prevail, and 1.05c., Pittsburgh, is an open quotation throughout the territory. In the West the prospect of a return to higher prices seems very clearly to hinge upon the

prior placing of a round tonnage with the mills. Quotations on sheets betray the apparently increasing weakness of many of the smaller mills. For the present the needs of pig-iron buyers appear to have been met, and the past week has seen few transactions. In the scrap market buying by consumers is very limited but there is apparently just as little pressure to sell, and prices continue to have upward tendencies.

Pig Iron.—The buying movement appears to have practically exhausted itself. At least the lull which has come with the inventory period has temporarily limited activity to a few miscellaneous transactions. It is understood that the inquiry for 2500 tons which has been the item of principal importance during the past 10 days has been closed. Prices for Northern iron have registered but little net gain as the result of the buying that has been done, while Southern iron is now selling at 50c. a ton below the nominal price a few weeks ago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal	$15.75 to $16.75
Northern coke foundry, No. 1	13.25 to 13.75
Northern coke foundry, No. 2	12.75 to 13.25
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	13.75 to 14.25
Southern coke, No. 2 f'dry and 2 soft	13.50 to 13.75
Malleable Bessemer	12.75 to 13.25
Standard Bessemer	15.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. silvery, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. sil'vy, 10 per cent.	18.90 to 19.40

Rails and Track Supplies.—Very little business has come from the railroads the past week for track work. A few specifications against recent spike and bolt contracts only are reported. We quote standard railroad spikes at 1.50c. to 1.60c., base; track bolts with square nuts, 1.90c. to 2c. base, all in carload lots, Chicago; tie plates, $23.50 to $25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—The Illinois Central inquiry for 1000 refrigerator cars seems not to have been closed as yet, and if the car builders are seeking this order they have thus far refrained from covering themselves for the steel. The prospective asking of figures for the Lyon & Healy and Buck & Raynor buildings, together with the proposals submitted last week for 5500 tons for the Kimball Building, are the principal structural projects now in sight. The McClintic-Marshall Company will fabricate 1500 tons for a cotton warehouse at New Orleans. The aggregate of specifications and orders for immediate shipment last week probably exceeded those of any previous week of the month. As yet prices show no response to the better market feeling, and we continue to quote on plain material from mill 1.20c. to 1.25c., Chicago.

We quote for structural shapes out of stock 1.75c., Chicago.

Plates.—The Willamette Iron & Steel Company has taken an order for a pipe line for Oregon City, Ore., calling for 2800 tons of plates. There is a fair inquiry from plate users desiring to cover for first quarter and first half and some contracts have been placed on the basis of 1.10c., Pittsburgh, for first quarter and 1.15c. for the second quarter. For prompt delivery very close prices are obtainable, and we quote for Chicago delivery from mill 1.20c.

We quote for plates out of Chicago stock 1.75c.

Sheets.—Recent quotations for galvanized sheets indicate increasing weakness in the position of some of the sheet mills. The stability of 2.70c., Pittsburgh, for No. 28 as a minimum price may now be seriously questioned. These exceptionally low prices do not appear to have brought out any additional tonnage and the operating situation with the larger number of sheet mills is badly disorganized. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.989c.; No. 28 galvanized, 2.889c. to 2.939c.

We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.55c.

Bars.—Specifications for steel bars taken by one interest the past week are reported as aggregating 12,000 tons. Of this 1000 tons of reinforcing bars will go into railroad construction. The agricultural implement interests also participated in this buying and they have been ordering hard steel agricultural shapes as well. December will show an improvement in the shipments of bar iron although the tonnage is still very small. Bar-iron prices are probably firmer, with 0.95c. less easy to obtain by buyers on all kinds of business. We quote for mill shipments as follows: Bar iron, 0.95c. to 1c.; soft steel bars, 1.189c. to 1.25c.; hard steel bars, 1.15c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—Some little eagerness to have bolt contracts closed up before the end of the year is noticeable on the part of those whose requirements have been under negotiation. But specifications providing for early shipment are still very scattering. We continue to quote: Carriage bolts up to ⅝ x 6 in., rolled thread, 85; cut thread, 80-20; larger sizes, 80; machine bolts up to ¾ x 4 in., rolled thread, 85-5; cut thread, 85; larger sizes, 80-5; coach screws, 85-10; hot pressed nuts, square head, $6.60 off per cwt.; hexagon, $7.60 off per cwt. Structural rivets, ¾ to 1¼ in., 1.58c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices on bolts are subject to radical concessions and a new schedule of discounts seems inevitable. Nominally we quote out of store: Structural rivets, 2.20c.; boiler rivets, 2.30c.; machine bolts up to ¾ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ¾ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square head, $6, and hexagon, $6.70 off per cwt.

Wire Products.—The wire trade during the current fortnight reflects the absence of salesmen from their territory. There is little of interest or significance to report. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.539; wire nails, $1.739; painted barb wire, $1.739; galvanized, $2.139; polished staples, $1.739; galvanized, $2.139, all Chicago.

Old Material.—While the prices which are being asked by middlemen in the scrap market may be easily determined, the fact that there is little or no consumer buying, and further that in few instances are they willing to concede as much as is being asked leaves actual market values a matter of rather indefinite compromise. The tendency, however, continues in the direction of higher prices. The Chicago, Rock Island & Pacific is asking bids on 3200 tons of scrap. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$11.25 to $11.50
Old steel rails, rerolling	9.50 to 10.00
Old steel rails, less than 3 ft	9.50 to 9.75
Old carwheels	9.75 to 10.25
Heavy melting steel scrap	8.75 to 9.00
Frogs, switches and guards, cut apart	8.75 to 9.00
Shoveling steel	8.50 to 8.75
Steel axle turnings	6.75 to 7.00

Per Net Ton

Iron angles and splice bars	$11.00 to $11.50
Iron arch bars and transoms	11.00 to 11.50
Steel angle bars	8.00 to 8.25
Iron car axles	14.00 to 14.25
Steel car axles	10.75 to 11.25
No. 1 railroad wrought	8.25 to 8.75
No. 2 railroad wrought	7.50 to 8.00
Cut forge	7.50 to 8.00
Steel knuckles and couplers	8.25 to 8.50
Steel springs	9.00 to 9.50
Locomotive tires, smooth	8.50 to 9.00
Machine shop turnings	5.25 to 5.50
Cast borings	4.50 to 5.00
No. 1 busheling	7.25 to 7.75
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	5.00 to 5.50
Boiler punchings	7.75 to 8.00
No. 1 cast scrap	9.25 to 9.50
Stove plate and light cast scrap	8.00 to 8.25
Grate bars	7.75 to 8.00
Railroad malleable	8.00 to 8.25
Agricultural malleable	7.25 to 7.50
Pipes and flues	6.25 to 6.75

Cast-Iron Pipe.—The award of 7500 tons of small diameter pipe at Chicago was divided equally among the United States Cast Iron Pipe & Foundry Company, the American Cast Iron Pipe Company and the Lynchburg Foundry Company. An additional letting of contracts for large sized pipe is expected, but no date has been set. Bids will be received at Cincinnati December 30 for 2400 tons of 36-in. In a general way the pipe trade is still exceedingly dull. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $23.50; 16 in. and up, $23, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., December 29, 1914.

While the market shows the usual end-of-the-year lull, so far as the majority of products and materials are concerned, a great deal of satisfaction is expressed by steel companies, who supply railroad requirements, with the better run of orders which they have received since the announcement of the railroad freight rate decision. Steel rails, in particular, have been more active. Furthermore, the outlook for additional orders is bright. The tonnage booked had a big rise in December with one mill. With another, the December betterment varied from 50 to 85 per cent. on different products. Announcement has been made that the 1.20c., Philadelphia, quotation on steel bars, plates and shapes will be withdrawn December 31, and that the minimum price thereafter will be 1.25c., Philadelphia, for first quarter and 1.30c. for the second. Plates and bars have had a fair week only, but they are stronger. Structural material continues most disappointing. Billets and sheets are quiet also and their prices unimproved. The mills have slowed up operations for the holidays and one shut down completely December 24 and will partly resume about January 4. Pig iron has been extremely quiet. Old material is quiet also, but in furnace coke a number of contracts have been placed.

Iron Ore.—The market presents nothing of interest, with demand totally absent. From Cuba there arrived last week 6500 tons.

Pig Iron.—Business has been extremely dull, which is to be expected at this season, but the trade is confident that the early part of next year will bring a revival of activity. Of course there has been buying of small lots here and there and this has included the taking of a few hundred tons of standard low phosphorus at $20, delivered. It is reported that the making of standard low phosphorus iron will be discontinued by a producer who recently began the manufacture of this grade and sold approximately 1000 tons to nearby steel companies. Lebanon low phosphorus has a firmer tendency. Virginia and Southern irons have shared the dullness of the eastern Pennsylvania product. A few cases are reported of requests that deliveries be postponed until after January 1. A shipment of 100 tons of Swedish iron arrived here last week. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X foundry	$14.25 to $14.50
Eastern Penna. No. 2 plain	14.00 to 14.25
Virginia No. 2 X foundry	15.25
Virginia No. 2 plain	15.00
Gray forge	13.50 to 13.75
Basic	13.50 to 14.00
Standard low phosphorus	20.00 to 21.00

Ferroalloys.—No change of any kind is reported in the situation with regard to ferromanganese, the price for 80 per cent. remaining at $68, Baltimore, providing it can be obtained. There is no inquiry in this territory. The quotation for 50 per cent, ferrosilicon continues at $71 to $73, Pittsburgh, according to quantity.

Plates.—Makers are looking for an increase in demand, following the expected placing of orders for cars and locomotives, although up to this time they have perceived no betterment in this respect. With one Eastern mill orders for small miscellaneous lots have been numerous and it is stated that with the proper amount of railroad orders its business would be normal. Requests for contracts at 1.20c., Philadelphia, aggregate a large tonnage, but the first quarter price is declared to be 1.25c., Philadelphia, while $1 per ton more is asked for second quarter delivery.

Bars.—Demand was quiet last week. It is probable that considerable business in steel bars will be booked in the last few hours of this year because of an announcement by the mills that the 1.20c., Philadelphia, price would positively be withdrawn December 31 and 1.25c. made the quotation for the first quarter, with 1.30c. asked for the second quarter. Iron bars are stronger at 1.17½c., Philadelphia. Inquiries and sales were better.

Structural Material.—No betterment is apparent in the demand for either plain or fabricated shapes. Of current interest are a building for the Victor Talking Machine Company, Camden, N. J., which requires 600 to 700 tons, and some small bridges for the Pennsylvania Railroad, which will take a few hundred tons. In both cases bids were submitted December 28. The quotation for delivery here continues at 1.20c. for prompt delivery, though announcement has been made that this price will be withdrawn December 31.

Billets.—A few sales running into good tonnage have been made, but demand is by no means brisk or general. A maker of horseshoe calks has taken about 1000 tons of special steel which is ultimately to be exported. Current business is reported to have been done at concessions from the quotation of $21.40, Philadelphia, for open-hearth rolling billets. Forging steel is $4 a ton higher.

Sheets.—The week has been quiet, and no change is reported in quotations, which are 1.45c. to 1.50c. for No. 10 blue annealed sheets for prompt delivery, with $1 to $2 per ton more on contract.

Coke.—The majority of the mills have closed contracts for furnace coke at about $1.75 per net ton at oven for standard Connellsville coke. Prompt foundry coke is dull at $2 to $2.25 per net ton at oven, and $2.35 to $2.50 on contract. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—Actual business has not arrived except in a fairly good demand for specialties, but a general betterment is expected to come early in 1915. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$9.50 to $10.00
Old steel rails, rerolling	10.50 to 11.00
Low phosphorus heavy melting steel scrap	13.50 to 14.00
Old steel axles	13.00 to 13.50
Old iron axles	17.50 to 18.00
Old iron rails	13.00 to 14.00
Old carwheels	10.50 to 11.00
No. 1 railroad wrought	11.75 to 12.25
Wrought-iron pipe	9.50 to 10.00
No. 1 forge-fire	8.00 to 8.50
Bundled sheets	8.00 to 8.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	7.75 to 8.25
Cast borings	7.75 to 8.25
No. 1 cast	11.75 to 12.25
Grate bars, railroad	8.00 to 8.50
Stove plate	8.00 to 8.50
Railroad malleable	9.00 to 9.50

Buffalo

BUFFALO, N. Y., December 28, 1914.

Pig Iron.—Inquiry is light and very little business has been done. Some foundries are closed down until after the inventory period and furnacemen are making only slight effort to secure orders. Shipments on contracts are going forward in good volume, however. Prices remain unchanged and firm. We quote as follows for first quarter and half delivery, f.o.b. furnace:

No. 1 foundry	$13.25 to $13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	13.00
No. 3 foundry	13.00
Gray forge	12.75 to 13.00
Malleable	13.00 to 13.25
Basic	13.50
Charcoal, regular grades and analysis	16.25 to 17.25
Charcoal, special grades and analysis	20.50

Finished Iron and Steel.—Selling agencies report that the month of December, even taking the holiday slackening into consideration, has shown larger tonnage placed than in November, both in orders and in contracts. It develops that nearly all the principal buyers have covered requirements for the first quarter at 1.10c.

Pittsburgh base, for bars, plates and shapes. Some of the sales agencies predict an advance in January to 1.15c. for prompt and first quarter and 1.20c. for second quarter. Many inquiries and orders are coming in for sheet metal and stamped metal work. It is reported that the General Railway Signal Company, Rochester, has closed for signal apparatus for the Brooklyn Rapid Transit, totaling $1,293,494 in amount. The Lackawanna Bridge Company has 1000 tons for the Lehigh Valley pier shed, New York City.

Old Material.—The market is still experiencing holiday quiet, but a renewal of inquiry is looked for with the advent of the new year. Dealers' schedule of asking prices, per gross ton, f.o.b. Buffalo, are unchanged, as follows:

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	12.50 to 13.00
No. 1 railroad wrought scrap	9.50 to 10.00
No. 1 railroad and machinery cast	10.00 to 10.50
Old steel axles	11.50 to 12.00
Old iron axles	16.00 to 16.50
Old carwheels	10.00 to 10.50
Railroad malleable	9.00 to 9.50
Machine shop turnings	5.00 to 5.50
Heavy axle turnings	8.00 to 8.50
Clean cast borings	5.50 to 6.25
Old iron rails	10.50 to 11.00
Locomotive grate bars	8.50 to 9.00
Stove plate (net ton)	8.00 to 8.50
Wrought pipe	6.50 to 7.00
Bundled sheet scrap	5.75 to 6.25
No. 1 busheling scrap	7.00 to 7.50
No. 2 busheling scrap	5.00 to 5.25
Bundled tin scrap	10.00

Cleveland

CLEVELAND, OHIO, December 29, 1914.

Pig Iron.—There has been a fair amount of quiet buying for the first half delivery in the past week, both by Cleveland consumers and in other parts of the northern Ohio territory. One sale of 2000 tons of malleable iron is reported, but other orders have been mostly for foundry iron. In the recent buying movement quite a number of the fairly large consumers did not come in the market and the new business has come from these foundries. With the prevailing low prices there is a disposition among consumers to purchase beyond their known requirements. Prices are firmer. Furnace companies have their order books well filled up and are not disposed to take on additional business at the lately prevailing prices. One Cleveland company has advanced its price on foundry iron 25c. a ton to $13.25 at furnace, for No. 2 for local delivery. Another Cleveland pig iron firm has not yet changed its quotations but will probably make a similar advance within a few days. Quotations for outside shipment are unchanged at $12.75 to $13. Prices have stiffened up in the Valley, where $12.75 is the minimum quotation and most sellers are not quoting below $13. Southern iron is quiet with no change in prices. Most southern producers are holding to $10, Birmingham, for No. 2 foundry, but $9.50 iron has not disappeared. We quote, delivered Cleveland, as follows:

Bessemer	$14.70 to $14.95
Basic	13.45
Northern No. 2 foundry	13.25 to 13.50
Southern No. 2 foundry	13.50 to 14.00
Gray forge	13.00
Jackson Co. silvery 8 per cent. silicon	17.62
Standard low phos., Valley furnace	20.00 to 20.25

Iron Ore.—Furnace yards are well supplied and only a small amount of ore is moving from the docks. No interest has yet been taken in the market for the coming year. We quote prices as follows: Old Range Bessemer, $3.75; Mesaba Bessemer, $3.50; old Range non-Bessemer, $3; Mesaba non-Bessemer, $2.85.

Coke.—There has been very little contracting of foundry coke for the first half delivery and sellers are looking for some demand after January 1 from consumers who did not cover for their full year's requirements last summer. We quote best makes of Connellsville coke at $2.25 to $2.50 per net ton at oven for contract. Furnace coke is held at $1.50 to $1.60 for prompt shipment and $1.75 for contracts.

Finished Iron and Steel.—Efforts are being made to get better prices on steel bars, plates and structural material and most of the independent mills have withdrawn their 1.05c., Pittsburgh, quotation for spot shipment, effective January 1 and are quoting 1.10c. as their minimum price. The bulk of consumers are covered with contracts for the first quarter at this price, and if the advance holds, no readjustment of these contracts will be necessary. In spite of attempts to stiffen up prices, some spot business in steel bars has gone in the week as low as 1c., Pittsburgh, the seller, an Ohio mill, giving the buyer a portion of the freight advantage. While steel bar contracts through the first half, based on the 1.10c., Pittsburgh, price, have been generally limited to the implement trade, it is probable that other consumers can secure the 1.10c. price to July 1. The demand shows some improvement but this is at least partly due to the fact that consumers are sending in specifications for 1.05c. steel on orders that call for specifications before the end of the year. The demand for iron bars is dull, the general quotation is about 1.20c. for Cleveland delivery. In structural lines the McClintic-Marshall Company was low bidder for the Division avenue city pumping station requiring 1300 tons and the Forest City Steel & Iron Company has taken 750 tons for the Garfield Hotel, Cleveland. Contracts have been placed for an addition to Charity Hospital and for the Crown Block, Cleveland, requiring 125 and 300 tons of reinforcing bars, respectively. There is a fair demand for sheet contracts for the first quarter which are being placed at 1.80c., Ohio mill, for No. 28 black, 2.80c. No. 28 galvanized and 1.35c. for No. 10 blue annealed. Mills are asking an advance of $2 a ton over these prices for the second quarter. Some first quarter forging billet contracts have been placed at $24, base Pittsburgh. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—Current demand for bolts and nuts has improved. The market is not firm and prompt shipment business is being taken at prices 5 to 10 per cent. below regular quotations, which are also being shaded for contracts. Rivet prices are irregular. The regular quotations for carload lots are 1.45c., Pittsburgh, for structural and 1.55c. for boiler rivets, for prompt shipment and the first quarter, with an advance of $1 a ton for second quarter, but boiler rivets have sold as low as 1.35c. for delivery during the entire first half. Discounts are as follows: Common carriage bolts ⅝ x 6 in., smaller or shorter, rolled thread, 80 and 10 and 5 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 80 and 10 and 10 per cent.; cut thread, 80 and 10 and 5 per cent.; larger or longer, 80 per cent.; coach and lag screws, 80 and 5 per cent.; square h. p. nuts, blank or tapped, $6.50 off; hexagon h. p. nuts, blank or tapped, $7.40 off; c. p. c. and t. square nuts, blank or tapped, $6.20 off; hexagon ⅝ in. and larger, $7.50 off; 9/16 in. and smaller, $8 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10 and 10 per cent., 9/16 in. and smaller, 85, 10, 10 and 10 per cent.

Old Material.—Most mills have under contract all the material they will need for a few weeks, and there is practically no demand. Dealers look for a renewal of buying soon after the holidays. The general sentiment in the trade is good and prices are well maintained at recent levels. A Sharon consumer has held up shipments until January 15, but other mills continue to take shipments. There are no changes in prices. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails, rerolling	$11.00 to $11.75
Old iron rails	12.00
Steel car axles	12.25 to 12.75
Heavy melting steel	9.25 to 9.50
Old carwheels	10.00 to 10.50
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	8.00 to 8.50
Railroad malleable	9.25 to 9.50
Light bundled sheet scrap	7.50 to 8.00

Per Net Ton

Iron car axles	$16.75 to $17.00
Cast borings	5.50 to 5.75
Iron and steel turnings and drillings	5.00 to 5.25
Steel axle turnings	6.00 to 6.25
No. 1 busheling, new	8.00 to 8.50
No. 1 busheling, old	8.00 to 8.25
No. 1 railroad wrought	9.00 to 9.50
No. 1 cast	10.00 to 10.50
Stove plate	7.50

Cincinnati

CINCINNATI, OHIO, December 29, 1914.

Pig Iron.—Several inquiries from nearby melters, as well as from Indiana and Michigan, are still before the trade, but it will doubtless be several days after the opening of the new year before any contracts are closed. New inquiries that have come out lately include 500 tons of Southern iron wanted by a northern Ohio melter and a like quantity of Northern iron from the same territory, both for first half. While there is some complaint as to shipments being held up on old contracts, on the other hand quite a number of consumers are taking iron due them as fast as it can be shipped. The large export business received by machine-tool builders in the last quarter and the generally favorable developments in nearly all other branches of business have inspired some optimism as to the outlook. Leading iron merchants do not expect any radical improvement in either the consumption of pig iron or in prices, but they all claim that signs point to a steady change for the better. Some Southern iron is still to be had at $9.50, Birmingham, for first half, but the majority of the furnace interests are holding out for a higher price. Northern foundry is unchanged and malleable and basic are both very quiet. Foundry yard stocks in this territory are said to be smaller than for a number of years. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$12.90 to $13.40
Southern coke, No. 2 f'dry and 2 soft	12.40 to 12.90
Southern coke, No. 3 foundry	11.90 to 12.40
Southern No. 4 foundry	11.40 to 11.90
Southern gray forge	10.90 to 11.40
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.01 to 15.51
Southern Ohio coke, No. 2	14.01 to 14.51
Southern Ohio coke, No. 3	13.76 to 14.01
Southern Ohio malleable Bessemer	14.26
Basic, Northern	14.51 to 15.01
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	26.90 to 27.40

Coke.—With the exception of a better demand for domestic coke there is nothing in the way of new contracting. The 15,000 tons of furnace coke wanted by a southern Ohio furnace is still unbought. Contract shipments are going forward at a better rate than was expected. Connellsville 48-hr. coke is quoted around $1.60 to $1.75 per net ton at oven, and foundry grades are held all the way from $2 to $2.30. Wise County and Pocahontas operators are asking 10c. to 20c. above these figures.

Finished Material.—Several small but unexpected orders for galvanized sheets were booked last week by a nearby rolling mill. For a holiday season business is not disappointing. Reinforcing concrete bars are naturally slow in moving, even on old contracts, as the severe weather has practically stopped outdoor operations. We quote No. 28 black sheets at 2c. and galvanized at 3c., f.o.b. cars Cincinnati or Newport, Ky. Warehouse prices on steel bars and structural shapes range from 1.70c. to 1.75c. Hoops and bands are quiet.

Old Material.—Business continues quiet, but considerable scrap has been shipped to the foundries in the past 30 days. The rolling mills are not taking any interest in the market, as most of them have enough scrap on hand to last them for several months. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$6.25 to $6.75
Old iron rails	11.00 to 12.00
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	9.75 to 10.25
Melting steel rails	8.75 to 9.25
Heavy melting steel scrap	8.50 to 9.00

Per Net Ton

No. 1 railroad wrought	$7.50 to $8.00
Cast borings	4.00 to 4.50
Steel turnings	4.00 to 4.50
Railroad cast scrap	9.25 to 9.75
No. 1 machinery cast scrap	9.75 to 10.25
Burnt scrap	6.00 to 6.50
Old iron axles	13.50 to 14.00
Locomotive tires (smooth inside)	8.75 to 9.25
Pipes and flues	5.50 to 6.00
Malleable and steel scrap	6.75 to 7.25
Railroad tank and sheet scrap	4.50 to 5.00

Birmingham

BIRMINGHAM, ALA., December 28, 1914.

Pig Iron.—The year is closing with the Southern pig-iron makers well sold up as compared with stocks on hand, sales being estimated at from 300,000 to 500,000 tons and stocks in the neighborhood of 350,000 tons. These sales have been made to a great extent on the $9.50 basis for the first half, one important interest entering into an active selling campaign in the last week of November and setting the pace that has since been followed by other makers. Some small lots have gone at $9.75, but that is the highest price that is now mentioned for the regular run of foundry. Negotiations involving 38,000 tons are under way and sales in all directions are reported as still comparatively brisk. The conviction is increasing that the volume of iron sold does not represent actual needs of consumers as much as superior inducements to buy. On the other hand, the steel tone appears to be better. In addition to large wire orders there is expectation of an order for a very considerable tonnage of rails for China. The Ensley plant of the Tennessee Coal, Iron & Railroad Company went on full day turn on Monday of this week in the rail department, and it is understood that there will be further operations in January. The inclination to advance to the $10 basis for Southern iron has not yet received substantial backing. We quote, per gross ton, f.o.b. Birmingham, as follows:

No. 1 foundry and soft	$10.00 to $10.25
No. 2 foundry and soft	9.50 to 9.75
No. 3 foundry	9.00 to 9.25
No. 4 foundry	8.75 to 9.00
Gray forge	8.50 to 8.75
Basic	9.50 to 10.00
Charcoal	22.50 to 23.00

Cast-Iron Pipe.—The Bessemer plant of the leading interest went on full time the first part of last week. The water pipe makers seem to feel a real encouragement, which is not shared by the makers of soil pipe, the latter being quite dull. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $20; 6-in. and upward, $18; with $1 added for gas pipe.

Coal and Coke.—No improvement is seen in the coal situation. The demand for steam coal continues small, and the slight variances in temperature in the South do not call for a large output from the domestic mines. Coke is at a minimum of manufacture, but sells at regular prices. We quote, per net ton, f.o.b. oven, as follows: Furnace coke, $2.75 to $2.90; foundry, $3.10 to $3.30.

Old Material.—Scrap dealers continue to report slack business with no standard price basis, each transaction standing alone. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$13.00 to $13.50
Old steel axles	12.50 to 13.00
Old iron rails	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	7.50 to 8.00
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.00 to 7.50
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	8.00 to 8.50
Tram carwheels	8.50 to 9.00
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., December 28, 1914.

Pig Iron.—Tentative inquiry continues and more buying is expected after the present week. A considerable number of small sales were closed but the aggregate was probably less than 5000 tons. Inquiries remaining unfilled include one for 600 tons of Lake Superior charcoal iron and one for 500 tons of Northern coke carwheel iron. Prices are reported a little firmer and there is no disposition to permit the present quotations to rule beyond the first quarter.

Coke.—For the most part the contracts in this territory run until July 1 and new business is not anticipated in quantity before that date. By-product is quoted on the Connellsville basis plus the freight rate.

Finished Iron and Steel.—The only new movement was the appearance of some inquiries for light rails from both lumber and coal companies. In bars about 3000 tons for the New Orleans municipal cotton ware-

house and compress went to the local office of the Corrugated Bar Company. In warehouse business the aggregate moving out of stock is encouraging of contract business within a short time. Prices for stock out of warehouse are as follows: Soft steel bars, 1.70c.; iron bars, 1.65c.; structural material, 1.80c.; tank plate, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.55c.

Old Material.—Scrap material shows increases in prices, with a growing demand from the foundry and steel interests. There is also some activity in the relaying rail division, but very little stock available to meet the demand. The only list out was one of 10,000 tons from the Baltimore & Ohio. We quote dealers' prices, f.o.b. St. Louis, as follows:

	Per Gross Ton	
Old iron rails	$10.00 to	$10.25
Old steel rails, rerolling	10.00 to	10.25
Old steel rails, less than 3 ft	10.00 to	10.25
Relaying rails, standard section, subject to inspection	21.00 to	23.00
Old carwheels	10.25 to	10.50
No. 1 railroad heavy melting steel scrap	9.50 to	9.75
Shoveling steel	8.75 to	9.00
Frogs, switches and guards, cut apart	9.50 to	9.75
Bundled sheet scrap	5.50 to	6.00
	Per Net Ton	
Iron angle bars	$10.50 to	$10.75
Steel angle bars	8.75 to	9.00
Iron car axles	15.00 to	15.50
Steel car axles	10.75 to	11.00
Wrought arch bars and transoms	10.75 to	11.25
No. 1 railroad wrought	8.00 to	8.25
No. 2 railroad wrought	7.75 to	8.00
Railroad springs	8.75 to	9.00
Steel couplers and knuckles	8.75 to	9.00
Locomotive tires, 42 in. and over, smooth	8.75 to	9.00
No. 1 dealers' forge	7.25 to	7.50
Mixed borings	5.00 to	5.25
No. 1 busheling	7.50 to	7.75
No. 1 boilers, cut to sheets and rings	5.50 to	6.00
No. 1 railroad cast scrap	9.50 to	10.00
Stove plate and light cast scrap	7.50 to	8.00
Railroad malleable	7.25 to	7.50
Agricultural malleable	6.50 to	6.75
Pipes and flues	6.00 to	6.25
Railroad sheet and tank scrap	6.00 to	6.25
Railroad grate bars	7.25 to	7.50
Machine shop turnings	5.75 to	6.00

New York

NEW YORK, December 30, 1914.

Pig Iron.—This market has been about as quiet as it ever gets. The activity which started with Buffalo and the East and then spread to the South is still noticeable in the Central West. None of the large companies having headquarters in New York are in the market and most inquiries are for small lots. For various navy yards the Government is about to buy something like 400 tons. The malleable foundries in the East have not felt any approach to larger buying by the railroads and their pig iron wants seem to be covered for some weeks to come. A few lots of low-phosphorus iron are under negotiation. Furnace operations in Virginia, eastern Pennsylvania, eastern New York and New Jersey seem to be at low point and a slight increase in production is likely as one Virginia furnace and one central Pennsylvania furnace, which finds its market in the East, will go in in January. We quote Northern iron for tidewater delivery unchanged as follows: No. 1 foundry, $14.45 to $14.95; No. 2 X, $14.20 to $14.45; No. 2 plain, $13.95 to $14.20. Southern iron is quoted at $14.50 for No. 1 and $14 to $14.25 for No. 2.

Ferroalloys.—A hitch in the diplomatic proceeding to lift the British embargo on ferromanganese is noted in another part of this issue of *The Iron Age*. While New York representatives of British makers are not cognizant of any fresh complications they are more or less in the dark as to future developments, having no advices from their principals as to the likelihood of the resumption of shipments under guarantees recently arranged. They are having numerous inquiries as to their ability to ship and no doubt the present stagnation would speedily give way to buying if the situation could be cleared up and shipments proceed. In the meantime quotations continue to be $68, seaboard, subject to ability to ship. Ferrosilicon, 50 per cent. is taking the normal course of the market at $71 to $73, Pittsburgh.

Finished Iron and Steel.—The Standard Oil Company has closed a contract for 20,000 tons of sheared plates with John J. F. Mulcahy, district sales manager in New York City for Worth Brothers Company. This order is understood to cover the Standard Oil requirements for the first half of 1915. Outside of this transaction the market is dominated by the usual holiday lethargy and inquiries and sales are practically without interest. A generally optimistic feeling is noted as to the possibilities of a revival of activity early in the new year. No immediate tangible benefits from the railroad rate decision are as yet in evidence. It is figured that the railroads are handling about 30 per cent. of the normal amount of freight, so that the increased charges allowable will not materially increase revenue, and new rolling stock can be bought on 60-day deliveries, so that purchases of cars can yet be delayed pending a revival in business. No developments are looked for in the structural line until January and no important contracts nor new inquiries are in evidence since last week, the aggregate tonnage of the few small projects still before the market being about 20,000 tons, exclusive of subway work. In car building the Illinois Central is understood to be asking for bids on 1000 refrigerator cars, while the Jane Oil & Gas Co., St. Louis, is reported to have ordered 100 tank cars from the Pennsylvania Tank Car Company and 50 from the American Car & Foundry Company. Sentiment in the bar iron market is reported as optimistic but the volume of orders is only fair for the last week. In general the 1.05c. Pittsburgh quotation on plates and shapes for prompt delivery has probably disappeared, and the mills are now quoting 1.10c. for delivery in the first quarter with little desire to contract beyond that date except for an advance. Some business has been closed at not less than 1.15c. for the second quarter. We quote prompt mill shipments of steel bars, shapes and plates at 1.10c., Pittsburgh, or 1.26c., New York. For first quarter we quote 1.10c. to 1.15c., Pittsburgh, or 1.26c. to 1.31c., New York, and iron bars at 1.20c. to 1.25c., New York. From store we quote iron and steel bars at 1.80c. to 1.85c., New York, and plates and shapes at 1.85c. to 1.90c. The Hedden Iron & Construction Company has been awarded a contract for a theater at Yonkers, N. Y., taking 600 tons.

Cast-Iron Pipe.—The city of Boston will open bids January 6 for 3800 tons. While municipal lettings are not numerous, which is usual at this season, private buying is brisk. More inquiries have been received this month from such buyers as gas companies and small water companies, with a much larger volume of buying of this character than in any December since 1906. The gas companies are taking considerably more cast-iron pipe than usual, some of them purchasing as much as three times their ordinary quantity, evidently being influenced by the exceedingly attractive prices prevailing. Confidence is growing in the early establishment of a foreign business in pipe. Information comes from South America that financial conditions there are steadily improving and intimations are given that large quantities of pipe will be needed the coming year. The market is firmer, but carload lots of 6-in. can still be had at $20 to $20.50 per net ton, tidewater.

Old Material.—General sentiment continues to improve, although buying is practically suspended, as is usual at the holiday and inventory season. Quotations are unchanged as follows, per gross ton, New York:

Old girder and T rails for melting	$7.25 to	$7.50
Heavy melting steel scrap	7.25 to	7.50
Relaying rails	19.00 to	19.50
Rerolling rails (nominal)	8.00 to	8.25
Iron car axles	14.00 to	14.25
Steel car axles	10.25 to	10.75
No. 1 railroad wrought	8.75 to	9.25
Wrought-iron track scrap	8.25 to	8.75
No. 1 yard wrought, long	8.25 to	8.75
No. 1 yard wrought, short	7.25 to	7.50
Light iron	3.50 to	4.00
Cast borings	5.50 to	6.00
Wrought turnings	5.50 to	6.00
Wrought pipe	7.00 to	7.25
Carwheels	8.75 to	9.25
No. 1 heavy cast, broken up	9.75 to	10.25
Stove plate	7.50 to	8.00
Locomotive grate bars	6.25 to	6.75
Malleable cast	7.00 to	7.50

The Cohen Iron Work Company, Inc., has removed from 220 Chester street to 69 Powell street, Brooklyn, N. Y.

Boston

BOSTON, MASS., December 29, 1914.

Old Material.—The market has changed little in the week. The dealers express hopefulness, based largely on sentimental influences. Normally, the closing fortnight of the year is a dull period, under any conditions. But the weeks following the opening of the new year are expected to develop improvement. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	$7.00 to $7.75
Low phosphorus steel	13.75 to 14.75
Old steel axles	12.75 to 13.25
Old iron axles	20.25 to 20.75
Mixed shafting	12.00 to 12.25
No. 1 wrought and soft steel	8.25 to 8.75
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	7.00 to 7.50
Cotton ties (bundled)	5.25 to 5.75
No. 2 light	3.25 to 3.75
Wrought turnings	5.00 to 5.50
Cast borings	5.00 to 5.25
Machinery cast	10.75 to 11.00
Malleable	7.50 to 7.75
Stove plate	7.00 to 7.50
Grate bars	5.25 to 5.50

British Steel Works Active

Steel Prices Advance—Germany Takes Norwegian Rails at a Low Price

(*By Cable*)

LONDON, ENGLAND, December 30, 1914.

The position is quite satisfactory as regards pig iron, the make being readily absorbed, while hematite iron is affected by the very difficult freight situation, which makes it almost impossible to ship ore from Spain. There is great activity at steel works. Semi-finished steel is firm, and while the United States is willing to sell the freight position prevents the doing of business. General buying is naturally quieter over the holidays. Tin plates make a poor showing, the market being much influenced by the export embargo which is still in evidence, though a few lots for Holland and elsewhere were released under guarantee that they were not for the enemy's use. The German Steel Works Union has taken 30,000 tons of rails for Norway at a price equal to only £5 6s. ($25.79) f.o.b. Nothing fresh is known concerning the ferromanganese position. Furnaces in blast in the three leading districts are 162 against 167 last year and 163 last week. Stocks of pig iron in Connal's stores are 103,502 gross tons; last week, 103,615 tons. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 7½d. ($3.07).

On Cleveland pig iron to-day's prices are not obtainable owing to a blizzard. One week ago warrants were 54s. 1d. ($13.16) and the makers' price on No. 3 Cleveland iron, f.o.b. Middlesbrough, was 54s. 6d. ($13.26).

Steel black sheets, No. 28, export, f.o.b. Liverpool, £8 17s. 6d. ($43.19) against £8 15s. ($42.58) last week.

Steel ship plates, Scotch, delivered local yards, £7 5s. ($35.28) against £6 17s. 6d. ($33.45) last week.

Steel rails, export, f.o.b. works port, £6 7s. 6d. ($31.02) against £6 5s. ($30.41) last week.

Hematite pig iron, f.o.b. Tees, 72s. 6d. ($17.64) against 70s. ($17.03) last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, 100s. ($24.33) against £4 17s. 6d. ($23.72) last week.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £6 17s. 6d. ($31.02) against £6 15s. ($32.84) last week.

Steel bars, export, f.o.b. Clyde, £7 5s. ($13.28).

The Punch Press, a bright 16-page publication, 4½ x 6 in., is issued monthly by the Globe Machine & Stamping Company, Cleveland, which was the founder and for several years the publisher of The Silent Partner.

Metal Market

New York

The Week's Prices

NEW YORK, December 30, 1914.

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Dec.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
23	13.50	13.12½	33.25	3.80	3.62½	5.60	5.45
24	13.50	13.12½	33.50	3.80	3.62½	5.60	5.45
26	13.50	13.12½	.....	3.80	3.62½	5.60	5.45
28	13.50	13.00	33.75	3.80	3.62½	5.60	5.45
29	13.50	13.00	33.25	3.80	3.62½	5.55	5.40

Copper is dull and weaker. Tin is a little lower with demand absent. Lead is quiet and weaker in the West. Spelter has declined. Antimony is dull and easier.

New York

Copper.—The market for electrolytic has been quiet and growing weaker. It is reported that second hands are willing to sell at 13c., 30 days, delivered, or less, but there is more talk than evidence of the concessions. It is certain, however, that first hands would accept bids of 13c., cash, New York, on desirable lots, which is less than they have been quoting. In Lake there has been more business on account of the activity of the mills in making up cartridge metal for export, which explains the premium asked for this grade. For some brands as high as 13.75c. is demanded. Manufacturers of copper locomotive fire-box plates have been doing a good business in exports to Greece, Russia and Australia.

Tin.—Except for some light business in futures the market has been quiet. Spot metal has been almost at a standstill and the poor demand counts for the absence of any premium which otherwise surely would exist in view of the light arrivals. This month only 660 tons has arrived. The statistics of the month will be watched with interest, the expectation being that shipments from the East will be large and the deliveries into domestic consumption unusually low. The situation now indicates an increase in the visible supply. The New York quotation yesterday was 33.25c. The quantity afloat is 2585 tons, a small part of which is due to arrive December 31.

Lead.—The domestic demand continues dull, but exports are holding up and this is saving the New York price from going down. The St. Louis quotation is sagging a little. The quotations are 3.80c. and 3.62½c. respectively.

Spelter.—This metal has continued to lose strength because of the light demand from both domestic and foreign sources. The New York quotation is 5.55c. and that at St. Louis 5.40c.

Antimony.—Dullness continues and the market on the whole is without feature except that the Japanese are reported to have bought back some contracts they had made for future delivery, in order to insure the sufficiency of their own supply. Quotations are about 14.50c. to 15c. for Cookson's, 13.50c. to 14c. for Hallett's and 12.50c. to 13c. for Chinese.

Old Metals.—Holiday conditions prevail. Dealers' selling prices are unchanged, being nominally as follows:

	Cents per lb.
Copper, heavy and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	9.00 to 9.25
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 9.75
Lead, heavy	3.55
Lead, tea	3.30
Zinc, scrap	4.00

Chicago

DECEMBER 28.—The week has been rather quiet, with some indications of weakness. Copper producers are holding out for full prices, but metal in second hands is being moved at a lower level than prevailed a week ago. Shading in lead quotations is more pronounced and spelter prices are off slightly. Quotations are as follows: Casting copper, 13c.; Lake copper, 13.25c., for prompt shipment; small lots, ⅛c. to ¼c. higher; pig

tin, carloads, 34.50c.; small lots, 37.50c.; lead, desilverized, 3.70c. to 3.75c., and corroding, 4c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c.; sheet zinc, 8.75c.; Cookson's antimony, 18c. to 20c., for cask lots; other grades, 15c. to 16c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 10.50c.; copper bottoms, 9c.; copper clips, 10c.; red brass, 9.50c.; yellow brass, 7c.; lead pipe, 3c.; zinc, 3.50c.; pewter, No. 1, 24c.; tinfoil, 28c.; block tin pipe, 30c.

St. Louis

DECEMBER 28.—The market has been quiet, with some recessions in quotations. Lead closed to-day at 3.62½c.; spelter, 5.50c.; tin, 35½c.; Lake copper, 13.75c.; electrolytic copper, 13.60c.; Cookson's antimony, 16c. In the Joplin ore market there was still further strengthening of prices. The basis range for 60 per cent. zinc ore was $50 to $52 per ton, with top settlement $55; calamine, $22 to $24, with the choicest as high as $30; lead ore, $47 for 80 per cent. The year closes with aggregate sales for the district about $2,000,000 less than the preceding year, the total for 1914 being $11,684,917. The outlook is regarded as good for further price advances. Miscellaneous scrap metals are quoted as follows: Light brass, 5c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8c.; heavy copper and copper wire, 9c.; pewter, 20c.; tinfoil, 24c.; tea lead, 3c.; zinc, 3c.; lead, 3c.

Iron and Industrial Stocks

NEW YORK, December 30, 1914.

The stock market has been quiet, but prices have been well maintained. Fluctuations have been within narrow limits. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	8 - 8¼	Pressed Stl., com.	33½ - 35
Am. Can, com...	22⅞ - 26	Ry. Spring, com.	23 - 23⅜
Am. Can, pref...	87¾ - 88	Republic, com...	18 - 18½
Am. Car & Fdy., com.	42¼ - 45	Republic, pref...	75½ - 75¼
Am. Car & Fdy., pref.	113	Rumely Co., com.	3⅞ - 5
Am. Loco., com..	21 - 23¼	Sloss, com.....	22 - 22½
Bald. Loco., pref.	102¾	U. S. Steel, com..	48 - 49½
Beth. Steel, com.	42½ - 45⅞	U. S. Steel, pref..	103¼ - 104⅝
Beth. Steel, pref..	88½ - 89	West'gh'se Elec..	66¾ - 68½
Case. (J.I.), pref.	77	Chic. Pneu. Tool.	50 - 50½
Colorado Fuel...	23 - 24	Cambria Steel...	42 - 43⅛
General Electric.	137½ - 139	Warwick	10
Gt. N. Ore Cert..	24 - 25½	Cruc. Steel, com.	11½ - 12½
Int. Harv., com..	90 - 90⅞	Cruc. Steel, pref.	77
Nat. En. & St., com.	10	Harb. Walk Ref., pref.	98½ - 99

Dividends

The Brier Hill Steel Company, regular quarterly, 1¾ per cent., payable January 1.

The Youngstown Sheet & Tube Company, regular quarterly, 1¾ per cent. on the preferred and 2 per cent. on the common stock, payable January 1.

The American LaFrance Fire Engine Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 2.

The American Screw Company, regular quarterly, 1½ per cent., payable December 31.

The E. W. Bliss Company, regular quarterly, 1¼ per cent. on the common and 2 per cent. on the preferred stock, payable January 2.

The Chicago Pneumatic Tool Company, regular quarterly, 1 per cent., payable January 25.

Manning, Maxwell & Moore, Inc., regular quarterly, 1½ per cent., payable December 31.

The National Enameling & Stamping Company, regular quarterly, 1¾ per cent. on the preferred stock, payable December 31.

The Pittsburgh Coal Company, regular quarterly, 1¼ per cent. on the preferred stock, payable January 25.

The Standard Screw Company, 1 per cent. on the common, 3 per cent. on class A and 3½ per cent. on class B stock, payable January 1.

The Westinghouse Electric & Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 15, and 1 per cent. on the common stock, payable January 30.

The Union Switch & Signal Company, regular quarterly, $1.50 on the common and preferred stocks, payable January 15.

The Westinghouse Air Brake Company, regular quarterly, $2, payable January 15.

The Yale & Towne Mfg. Company, regular quarterly, 1¾ per cent., payable January 2.

The Chandler Motor Car Company, regular quarterly, 1¾ per cent. on the preferred and an extra dividend of 2½ per cent. on the common stock. This makes 17½ per cent. paid on the common stock in the calendar year 1914.

The Washburn Wire Company, regular quarterly, 1¾ per cent. on the common and preferred stocks, payable January 2.

German Steel Works Union's Fiscal Year

The report of the German Steel Works Union for the fiscal year ending June 30, 1914, issued December 3, 1914, shows total deliveries to have been 6,124,310 metric tons, as compared with 6,514,081 tons in the previous fiscal year of 1912-1913, a decrease of 389,771 tons. The total deliveries of 6,124,310 tons compare with allotments of 6,450,168 tons for the fiscal year, representing a deficiency of 325,858 tons, or 5 per cent. In detail the deliveries of semi-finished steel decreased 184,215 tons as compared with the fiscal year of 1912-1913, and those of shapes by 341,252 tons, but the deliveries of railroad material advanced 135,696 tons over the previous year. In export trade the deliveries of heavy rails and sleepers were in excess of those for 1912-1913. Trade in light rails was keenly competed for by Belgian producers and in tram rails by both English and Belgian. In only one month, September, 1913, were the deliveries in excess of the corresponding month of the previous fiscal year.

The General Railway Signal Company, Rochester, N. Y., has secured the contract from the Brooklyn Rapid Transit Company for the installation of the electric cab signal system, to cost $1,293,494. With the exception of the signal system installed in the electric zone of the New York Central, it is the largest order that the General Railway Signal Company has ever booked. The contract covers a period of three years. George D. Morgan, vice-president of the company, says that its plant, which has been operating at only about 50 per cent. of capacity for several months, will, when work begins on this contract, increase its force to normal.

The Superior Shipbuilding Company, Superior, Wis., organized in the local boom period in 1885 and for 20 years an important factor in vessel construction, is about to go out of business as a builder and devote its attention to repair work. It is reserving its drydocks and repair shop and offering for sale all other property, comprising a large machine shop, boiler and carpenter shop, warehouses, large electric crane, foundry and associated buildings, together with several acres of water frontage. It is reported that the Soo Line is negotiating for the property for terminal purposes.

The Illinois Central is reported to have bought from the American Locomotive Company 25 switching and 25 Mikado type locomotives. The American Locomotive Company is also reported to have an order from the Nickel Plate for 15 and from Greece for 20 locomotives, while the Baldwin Locomotive Works is to build one 6-wheel and three 10-wheel switching locomotives for the Carolina, Atlantic & Western. The Philadelphia & Reading will build four passenger engines in its own shops.

The W. N. Durant Company, Milwaukee, Wis., manufacturer of counters for stamping and punching presses, conveyors, winding lathes and in general for machinery where it is desired to keep a line on production, has changed its name to the Durant Mfg. Company.

OBITUARY

Thomas Lynch

Thomas Lynch, president H. C. Frick Coke Company, died at his home in Greensburg, Pa., Tuesday, December 29, from the effects of an operation performed on December 16. He leaves his widow, a daughter and four sons. Born in Uniontown, Pa., in 1854, his first employment was as a clerk in a country store. He became superintendent of a mine and coke plant of H. C. Frick & Co. in 1877; in 1882 was appointed superintendent of the H. C. Frick Coke Company, was promoted to the position of general manager in 1890, and was made president in 1897. An extended account of his career will appear in the next issue of *The Iron Age*.

CHARLES MARTIN HALL, vice-president Aluminum Company of America, one of America's greatest chemists, died at Daytona, Fla., December 27, after a protracted illness. He was 50 years of age and unmarried. He was born in Thompson, Ohio, and educated in Oberlin College. Soon after graduation he turned his attention to the problem of producing pure aluminum by a cheaper process than then in vogue. For his experiments he used such apparatus as the college laboratory afforded and in eight months had completed an entirely new process, which was by dissolving alumina in a bath of cryolite and passing an electric current through the solution. His highest honor for his researches came in 1911, when he was awarded the Perkin Medal for his work in chemistry. He is credited with having made the commercial production of aluminum in this country easy and its use universal, so that a product which in 1886 was more costly than silver could be put on the market at a reasonable price. He was a member of the University Club of New York, University Club of Buffalo, American Association for the Advancement of Science, Institution of Electrical Engineers of Great Britain, American Philosophical Society, Franklin Institute and American Electro-Chemical Society. His home was in Niagara Falls, N. Y.

WALTER C. NOE, secretary of the Fuller & Johnson Mfg. Company, Madison, Wis., died at his home in that city, December 19, after an illness of one month, aged 62 years. He was born in Norfolk, Va., and received his early education at Racine College, of which he later became a trustee, holding the position to the time of his death. He located in Madison when a young man and entered the service of the Garnhardt reaper works. Subsequently he went to St. Louis, but remained there only three years and then returned to Madison, where he became a member of the firm of Firmin, Billings & Noe, which conducted the business of the then Madison Plow Company. This company later took the name of the Fuller & Johnson Mfg. Company, with Mr. Noe as secretary. He was active in the Protestant Episcopal Church and also interested in the politics of his home city, serving as a councilman. He leaves his widow, one son and two daughters, one of the latter being Mrs. Ellis F. Muther.

ALFRED HESS, vice-president Hess Spring & Axle Company, Carthage, Ohio, died at his home in Cincinnati, December 21, aged 79 years. His death was due to a fall on an icy pavement. He was a member of the Cincinnati Business Men's Club and of the Carriage Makers' Club. He leaves a son, E. J. Hess, president Hess Spring & Axle Company, and two daughters.

SAMUEL JACOBSEN, general manager of the Burlington Brass Works, Burlington, Wis., died last week of tumor of the brain, aged 45 years. Five years ago, while in New York on business, he fell on an icy walk and eight months ago he was obliged to take to his bed. He was a native of Copenhagen, Denmark, and became general manager of the company in 1906.

CHARLES H. SEMPLE, a director of the Beck & Corbitt Iron Company, St. Louis, died December 25, after a long illness, aged 71 years. He was born in Louisville, Ky., and removed to St. Louis when quite young. He was vice-president of the company for several years, but retired from active business a few years ago. He leaves his widow, three sons and one daughter.

FREDERICK GEORGE VON SPRECKELSON, general manager of the West Allis Chain Belt Company, Milwaukee, Wis., until two years ago, when ill health forced him to retire, died at his farm in Manchester, Tenn., December 16, aged 52 years. He was born in Indianapolis and went to Milwaukee as a youth, entering the employ of the Chain Belt Company.

WALWORTH M. MOONEY, Ausable Chasm, N. Y., died December 15, aged 81 years. He was a manufacturer of horseshoe nails and well known to the trade. He began business at Montreal in 1865, purchased the Ausable Chasm plant in 1876 and continued the manufacture of horse nails there until 1909.

German Iron and Metal Trades

European papers contain the following data on war conditions in German industries:

The deliveries of the Pig Iron Syndicate for November are estimated at 50 per cent. of the allotments, as compared with 49 per cent. in October. The action of the syndicate in raising the price of hematite iron by $2.43 per ton for the first quarter of 1915, following a previous increase of $1.22 per ton for the last quarter of 1914, has met with strong opposition from the Association of Iron Foundries and from the Foundry Syndictate, which have now asked the syndicate to reconsider the question. The contention is that forward contracts have always been concluded without taking into account this new advance and that they can not proceed under this handicap. A promised reconsideration of the matter by the syndicate on December 18 was not expected to alter the situation because of the great scarcity and high prices of hematite ores.

In addition to the export bounty of $1.15 to be paid by the Pig Iron Syndicate on pig iron used in export manufacture in connection with all foreign transactions effected since October 20 and completed within a period of six months from the contract date, the Steel Works Union is granting $1.82 per ton on semi-finished products and shapes and is said to be making a further payment of $1.82 per ton on material used in the construction of river steamers. The contracts which are still held by the Wire Rod Syndicate, now dissolved, provide for the payment, on material purchased from it, of a bounty of $4 per ton in the case of drawn wire for export and $5.11 per ton for wire nails.

Dissolution of the Wire Rod Syndicate is announced, though members were free on November 1 to undertake deliveries on their own account from that date. The price sought to be maintained was $29.17, but a few new contracts have been closed at a reduction and the price now stands at $26.73 to $27.12. The wire nail trade is much depressed, with offers down to $26.12 even for delivery throughout next year.

Members of the Zinc Works Syndicate are considering a proposal which holds out some hope of a continuance of the syndicate, independent of the late International Spelter Syndicate. An increase in prices is likely. The published list of maximum prices for nonferrous metals is expected soon on the approval of the Federal Council.

At the annual general meeting of the shareholders of Capito & Klein, Benroth, it was stated that business for the fiscal year had been unsatisfactory, with keen competition in dynamo sheets resulting in a decline in prices of 30 to 40 per cent. The demand for tin plates was reported to be satisfactory and the company announces that it has been able to find enough German workmen to displace the English so as to carry on the work successfully. The price has advanced lately. The German tin-plate industry is trying to oust British tin plates forever from the German market, and a suggestion is made that German measurements and classifications be adopted in place of the English ones. This would render future importations of Welsh tin plates difficult.

VERY IMPORTANT STATISTICS

Production of Wrought Pipe, Cast Pipe and Galvanized Sheets in 1913

Special Statistical Bulletin No. 10, just issued by William G. Gray, statistician of the American Iron and Steel Institute, gives the United States production in 1913 of wrought iron and steel pipe and boiler tubes, seamless drawn steel tubes, galvanized sheets, and cast-iron pipe. These statistics represent additions to statistical information, being collected for the first time.

WROUGHT IRON AND STEEL PIPE AND BOILER TUBES

The production of wrought iron and steel pipe and boiler tubes in the United States in 1913 amounted to approximately 2,245,532 gross tons, of which about 276,067 tons was iron and about 1,969,465 tons steel.

Of the total 830,472 tons was black standard pipe, of which 120,619 tons was iron and 709,853 tons steel; 266,940 tons was galvanized pipe, of which 25,323 tons was iron and 241,617 tons steel; 841,089 tons was oil country goods, of which 84,778 tons was iron and 756,311 tons steel; 179,211 tons was O. D. and miscellaneous pipe, of which 2159 tons was iron and 177,052 tons steel; and 127,820 tons was boiler tubes, of which 43,188 tons was iron and 84,632 tons steel.

Of the active plants, 2 were located in New York, 15 in Pennsylvania, 2 in West Virginia, 5 in Ohio, and 1 in Illinois. It was necessary to estimate the output of two plants. Four plants were idle during the whole of 1913—2 in Pennsylvania and 2 in Illinois.

There were 19 plants in 5 States which made iron or steel black standard pipe, of which 1 was located in New York, 10 in Pennsylvania, 2 in West Virginia, 5 in Ohio, and 1 in Illinois.

Ten plants made boiler tubes, of which 1 was located in New York and 9 were in Pennsylvania.

The production of hot-finished and cold-drawn seamless steel tubes in the United States in 1913 amounted to approximately 108,567 gross tons, of which about 42,740 tons was hot-finished tubes and about 65,827 tons cold-drawn tubes. It was necessary to estimate the output of a few plants. Of the active plants in 1913, 6 were located in Pennsylvania, 1 in Ohio, 1 in Michigan, and 1 in Wisconsin.

IRON AND STEEL GALVANIZED SHEETS

The total production in the United States in 1913 of iron and steel galvanized sheets and of articles which were formed or stamped from iron or steel black plates or black sheets and galvanized after the completion of the forming or stamping process amounted to about 1,961,080,107 lb.

The total production of galvanized sheets alone amounted to 1,811,752,565 lb., while the production of articles formed or stamped from iron or steel black plates or black sheets and galvanized after the completion of the forming or stamping process amounted to about 149,327,542 lb.

There were 92 plants which made iron or steel galvanized sheets or which stamped or formed articles from iron or steel black plates or black sheets and galvanized them after completing the forming or stamping process. Six of these were located in Massachusetts, 1 in Rhode Island, 2 in Connecticut, 7 in New York, 5 in New Jersey, 9 in Pennsylvania, 1 in Delaware, 3 in West Virginia, 2 in Kentucky, 2 in Georgia, 29 in Ohio, 4 in Indiana, 6 in Illinois, 4 in Michigan, 4 in Wisconsin, 4 in Missouri, and 3 in Iowa.

There were 61 plants in 1913 which manufactured or stamped black plates or black sheets into various forms and galvanized these forms after the completion of the forming or stamping process. Six of these plants were located in Massachusetts, 1 in Rhode Island, 2 in Connecticut, 6 in New York, 5 in New Jersey, 6 in Pennsylvania, 2 in West Virginia, 2 in Georgia, 10 in Ohio, 1 in Indiana, 5 in Illinois, 4 in Michigan, 4 in Wisconsin, 4 in Missouri and 3 in Iowa.

CAST-IRON PIPE AND FITTINGS

The production in the United States in 1913 of cast-iron gas and water and soil and plumbers' pipe and fittings amounted to 1,266,245 net tons, of which 1,002,289 tons was gas and water pipe and fittings and 263,956 tons soil and plumbers' pipe and fittings. The production of gas and water pipe includes 46,831 tons of fittings, while the production of soil and plumbers' pipe includes 68,925 tons of fittings and 7727 tons of culvert pipe.

Of the 67 active plants, 1 was located in Massachusetts, 6 in New York, 9 in New Jersey, 9 in Pennsylvania, 1 in Maryland, 3 in Virginia, 1 in Kentucky, 3 in Tennessee, 2 in Georgia, 15 in Alabama, 1 in North Carolina, 9 in Ohio, 1 in Indiana, 3 in Illinois, and 1 each in Michigan, Colorado and Oregon.

Thirty-four plants reported the manufacture of cast-iron gas and water pipe and fittings in 1913, of which 1 was located in Massachusetts, 2 in New York, 5 in New Jersey, 5 in Pennsylvania, 1 in Maryland, 3 in Virginia, 1 in Kentucky, 1 in Tennessee, 1 in Georgia, 5 in Alabama, 6 in Ohio, 1 in Michigan, 1 in Colorado, and 1 in Oregon. Four of the plants made cast-iron soil and plumbers' pipe and fittings as well as gas and water pipe.

There were 37 plants which made soil or plumbers' pipe or cast-iron culvert pipe in 1913, of which 5 were located in New York, 5 in New Jersey, 4 in Pennsylvania, 1 in Maryland, 2 in Tennessee, 1 in Georgia, 11 in Alabama, 1 in North Carolina, 3 in Ohio, 1 in Indiana, and 3 in Illinois. Four of the plants also made gas and water pipe.

Pittsburgh and Nearby Districts

The Ohio Iron & Steel Company, operating a blast furnace at Lowellville, Ohio, has placed an order with the Pittsburgh office of the Babcock & Wilcox Company for 2400-hp. Rust type water-tube boilers. It will probably add 600 more hp. boilers for the furnace at a later date.

The plant of the Superior Steel Company at Carnegie, Pa., near Pittsburgh, manufacturer of cold-rolled strip steel and other specialties, was damaged by fire last week to the amount of about $100,000, fully covered by insurance. The company states there will be no delay in filling orders, as its main rolling mill was not damaged.

The Bessemer Gas Engine Company, Grove City, Pa., will take over, January 1, the plant of the Bessemer Foundry Company, which has been operated for 12 years and which has been making the castings for its engines.

George J. Hagan, engineer and contractor, Peoples Bank Building, Pittsburgh, has received orders recently for Hagan American underfeed stokers as follows: Phillips Sheet & Tin Plate Company, for both the Weirton and Steubenville plants, National Enameling & Stamping Company, Scullin-Gallagher Iron & Steel Company, Seneca Iron & Steel Company, Crucible Steel Company of America, Johnston & Jennings Company, Western Reserve Steel Company, C. Pardee Works, Commercial Acid Company, the Belmont Stamping & Enameling Company, Mansfield Sheet & Tin Plate Company and Jones & Laughlin Steel Company.

J. H. Bricker has been appointed receiver of the Pittsburgh Steam Packing Company, 210 Second avenue, Pittsburgh.

The Witherow Steel Company, Pittsburgh, has filed notice of an increase in its capital stock from $25,000 to $50,000.

J. Rogers Flannery, president of the Pittsburgh Foreign Trade Commission, has returned from abroad. He reports that he brought home with him inquiries for materials for foreign shipment covering 200,000 projectile shells for France, 2300 tons cold-rolled strip steel for Russia, 4200 projectile shells for Russia, 7200 steel detonators for Russia, 1800 tons steel bars for Russia, 3000 seamless steel oxygen tanks and 5000 carwheels and axles for an Italian railroad.

Plans are underway by which the Westinghouse Electric & Mfg. Company will take over the Westinghouse Machine Company, whose large plant is at the same place. The executors of George Westinghouse are assisting in the merger, by which one share of the

common stock of the Electric Company will be given for three shares of the stock of the Machine Company. The merger was under way about a year before the death of Mr. Westinghouse, but he refused to exchange his Machine Company stock for Electric Company stock, except on equal terms.

The Kennedy-Stroh Corporation, Pittsburgh, has applied for a charter with $1,600,000 stock and $750,000 bonds. The new company proposes to take over the business of the Best Mfg. Company, Oakmont, Pa., but full details have not yet been worked out. W. H. Schoen will be president of the new company.

The New Castle Rubber Company, which has applied for a charter, proposes to make automobile tires in a part of the plant formerly operated by the New Castle Forge & Bolt Company, New Castle, Pa. John S. Wilson is president.

Customs Decisions

SHIPBUILDING TOOLS NOT FREE

The Fore River Shipbuilding Corporation has lost a protest filed with the Board of United States General Appraisers involving the dutiability of a variety of tools and appliances used in the installation of the electrical apparatus of the Argentine battleship Rivadavia. The customs authorities imposed regular duty at the rate of 20 per cent. under paragraph 167 of the tariff act of 1913, as manufactures of metal not specially provided for. The tools were claimed by the importer to be entitled to free entry under section 3 of the Panama Canal act, approved August 25, 1912, as materials of foreign production which may be necessary for the construction of vessels built in the United States. This provision further specifies duty exemption on all materials necessary for the building of vessels' machinery and all articles necessary for their outfit and equipment. The protestant failed to submit testimony at the hearing, and, as the record appears to show that the proper duty was taken, the board affirms the assessment.

CARD CLOTHING GRINDERS ARE MACHINE TOOLS

Leigh & Butler, Boston, were sustained in their contention that card clothing grinding machines are properly dutiable under the tariff of 1909 as machine tools at the rate of 30 per cent. The machines are described as Dronsfield patent traverse wheel grinders and Dronsfield patent rollers, both of which are attached to a carding machine. The collector's action in returning the merchandise for duty at 45 per cent. under paragraph 199 as manufactures of metal is reversed.

BALL BEARINGS INVOICED AS WASHERS

The S. K. F. Ball Bearing Company, New York, has been overruled by the board regarding the classification under the tariff act of 1913 of merchandise invoiced as washers. The collector ignored the character of the goods given by the importer and imposed duty at 35 per cent. under the provision in paragraph 106 for "ball bearings and roller bearings, of iron or steel or other metal, finished or unfinished, and parts thereof." The protestant contended that the articles are properly dutiable either at 20 per cent. under paragraph 167 as manufactures of metal, or at 5 per cent. under paragraph 123 as washers. A witness for the importer testified that the sole purpose for which the aligning washers or aligning seats were designed or intended to be used is to give to the ball bearings a uniform spherical surface, thus distributing the load evenly over the full row of balls in the bearing. The witness further testified that the articles are known in the ball bearing trade as washers. Judge Fischer, however, disagreed with the evidence submitted. The general appraiser holds that these aligning washers do not correspond to the common and ordinary understanding of the term "washers" and are plainly "parts of ball bearings" within the meaning of the paragraph under which duty was taken. The collector is accordingly affirmed.

THRESHING MACHINE SELF-FEEDERS

A. S. Fraser, Buffalo, protested against the action of the custom house authorities in exacting duty at 45 per cent., under the act of 1909, on implements described in the invoices as special band cutters and self-feeders. The collector classified the articles as "manufactures of metal." Duty at 15 per cent. under paragraph 476 was claimed as agricultural implements. The latter paragraph makes special provision for a variety of agricultural machines, among them threshing machines. It appeared from the testimony that the self-feeder in controversy is used in connection with threshing machines, but that it is not itself a threshing machine, nor is it used for planting, drilling or reaping. The board reaches the conclusion that the feeders cannot be regarded as harvesters as that term has been construed judicially and hence cannot be considered as included within the class of machines enumerated in paragraph 476, the collector being affirmed.

JEWELERS' LATHES NOT MACHINE TOOLS

The board has taken adverse action on protests filed by Hammel, Riglander & Co., New York, relative to the classification of jewelers' lathes imported under the act of 1909. They were taxed at 45 per cent. under the metal manufacture provision, and were claimed to be properly dutiable at 30 per cent. as machine tools. As the lathes were not shown to have the characteristics of machine tools, the collector's return was affirmed. This decision will have the effect of excluding from rating as machine tools similar articles imported under the present tariff.

IRON OR STEEL DRUMS FOR CONTAINERS

The board has reversed its earlier decision in the protest case of the Strong & Trowbridge Company relative to the entry of iron and steel drums used as containers of gasoline. Paragraph 404 of the present tariff permits the free entry of drums of domestic or foreign origin when such drums contain acids or chemicals. In the earlier decision the board denied the protestant duty exemption on the ground that gasoline is not a "chemical." Since then the Department of Agriculture has announced that, in the opinion of the Bureau of Chemistry, gasoline, kerosene and lubricating oil may be considered, both scientifically and commercially, as chemicals. The board now sustains the protest on the ground that the decision of the highest chemical department of the Government must be respected.

The Gifford-Wood Company, Hudson, N. Y., has opened an office in suite 1038 Hudson Terminal Building, 30 Church street, New York, which will be managed by A. W. Berghoefer, who will have associated with him Joseph A. Boucher, both engineers of several years' service with the company. This office will cover New York City and the Hudson River up to and including Westchester County, all of New Jersey, southeastern Connecticut, southeastern Pennsylvania and the Southern States east of the Blue Ridge. The company manufactures elevating and conveying machinery, ice tools and sheet and structural steel work.

The Grand Prize at the Second International Exposition of Safety and Sanitation, held at Grand Central Palace, New York, December 12 to 19, has been awarded to T. A. Willson & Co., Inc., Reading, Pa. This is the highest award ever given to makers of eye protectors and is in acknowledgment of the merits of the three Willson industrial styles—the Willson safety glass, the New Willson goggle and the Albex eye protector.

The Trumbull Steel Company, manufacturer of sheet and tin-mill products, Warren, Ohio, announces that Frank H. Colladay, its Eastern district sales manager, has taken larger offices in the Grand Central Terminal Building, New York City, in order to facilitate his growing business.

The Geuder, Paeschke & Frey Company, Milwaukee, Wis., has established an automobile-part department with special equipment for quantity production of gasoline tanks, mufflers, metal instrument boards, clutch cases, oil pans, drums, housings, hoods, fenders, covers, joint cases, etc.

SOUTHERN PIG-IRON RATES

The Case Reopened—Northern Roads Refuse to Share Reduction

WASHINGTON, D. C., December 29, 1914.—The Interstate Commerce Commission in the coming week will fix the date for the hearing upon the supplemental petition of the Sloss-Sheffield Steel & Iron Company and other Southern pig-iron producers who are suing to extend the application of the commission's decree of June 1, 1914, reducing freight rates on iron to numerous points in the North and East. The case has assumed extraordinary proportions, owing to the large number of defendants named in the petition, no less than 350 railroad systems, including nearly every carrier of importance from the Atlantic to the Pacific and from Canada to the Gulf, having been served in the proceedings. Interest in the case has also been greatly augmented by the action of a number of the principal carriers, included among those concurring in the original Washburn pig iron tariff, which have petitioned the commission for a decree fixing a division of the reduced rates as between the Northern and Southern railroads.

The original petition named certain defendants and embraced many other railroads in a general reference to "all roads concurring in the Washburn pig iron tariff." The commission, however, presumably through inadvertence, omitted many of the roads from the service of the complaint and subsequently found it impossible to enforce the decree of June 1 against some of the most important railroad systems, particularly those north of the Ohio River and those running to tidewater between Atlanta and New York. In the official order the commission states that the case has been reopened: "first, for further investigation and hearing as to the reasonableness of certain rates on pig iron from certain blast furnaces in Alabama and Tennessee to points in central freight association, trunk line, and New England territories not covered by the order heretofore entered herein, which rates were in issue in the original complaint filed in this case; second, for further investigation and hearing on the issues presented in complainant's supplemental complaint; third, to fix the proper divisions, under the authority conferred upon the commission by section 15 of the act, of the through rates established by the commission in the above-titled case, certain of which rates have been published by defendants, but no agreement having been made as to the divisions thereof."

The new feature of the case involving the controversy between the Northern and Southern roads as to the division of the reduced rates provided by the commission's original decree is attracting much attention. In its decision in the original case the commission said that "no change will be ordered in the proportional rates to the Ohio River at this time, for the reason that this would throw the entire reduction upon the Southern lines," and added that "the proportional rates to and from the Ohio River should be revised so as to make the through rate to Chicago, for example, not in excess of $4 per gross ton" [as against $4.35 then prevailing]. In the controversy regarding the division of rates the Northern roads contend that, during the period prior to 1907, whenever the rate on Southern pig iron was increased the Southern roads absorbed the entire amount, the Northern roads receiving only the net amount of the through rate which they had been allotted prior to the first increase. When the reductions were ordered in the commission's decree of June 1 the Southern roads insisted that a part of the cut should be borne by the Northern carriers who refused to share the reduction.

Another feature of the case of special interest is the decision of certain carriers not involved in the original case to contest the reasonableness of the reductions ordered by the commission's decree, which will probably result in reopening the issue on its merits. In view of the commission's action in allowing the 5 per cent. rate advance in official classification territory some of the Northern carriers are preparing to show that such changes have taken place in the railroad world since the Sloss-Sheffield case was argued as to justify an increase in the rate on Southern pig iron instead of a decrease. W. L. C.

Standard Old Metal Classification

The National Association of Waste Material Dealers, 170 Summer street, Boston, Mass., has just issued Circular A, which says:

The following standard of classification for old metals has been adopted by the National Association of Waste Material Dealers to be effective after January 2, 1915. This standard of classification was unanimously adopted at a meeting of the Metal Division held December 14, 1914, which action was approved by the executive committee of the association on the same date.

1. Delivery:

a. Delivery of more or less on the specified quantity up to 2½ per cent. is permissible.

b. If the term "about" is used, it is understood that 5 per cent. more or less of the quantity may be delivered.

c. Should the seller fail to make deliveries as specified in the contract the purchaser has the option of canceling all of the uncompleted deliveries or holding the seller for whatever damages the purchaser may sustain through failure to deliver and if unable to agree on the amount of damages, the Arbitration Committee of the National Association of Waste Material Dealers, appointed for this purpose, to determine the amount of such damages.

d. In the event that buyer should claim the goods delivered on a contract are not up to the proper standard, and the seller claims that they are a proper delivery, the dispute shall be referred to the Arbitration Committee of the National Association of Waste Material Dealers, to be appointed for that purpose.

e. A contract for a carload, unless otherwise agreed upon, shall mean the minimum quantity recognized by the official classification tariff of the district in which the seller is located.

f. A ton shall be understood to be 2000 lb., unless otherwise specified.

2. Heavy Copper:

This shall consist of copper not less than 1/16 in. thick, and may include trolley wire, heavy field wire, heavy armature wire, that is not tangled, and also new copper clippings and punchings, untinned and clean and copper segments that are clean.

3. No. 1 Copper Wire:

To consist of clean untinned copper wire not smaller than No. 16 B. & S. wire gauge, to be free from burnt copper wire which is brittle and all foreign substances.

4. No. 2 Copper Wire:

To consist of miscellaneous clean copper wire such as of necessity would be taken out of the heavy copper and the No. 1 copper wire, but to be free of hair wire and burnt wire which is brittle.

5. Light Copper:

Shall consist of the bottoms of kettles and boilers, bath tub linings, hair wire, burnt copper wire which is brittle, roofing copper and similar copper, free of visible iron, brass, lead and solder connections, old electrotype shells and free of excessive paint, tar and scale.

6. Composition or Red Brass:

Shall consist of red scrap brass, valves, machinery bearings and other parts of machinery, including miscellaneous castings made of copper, tin zinc and/or lead, no piece to measure more than 12 in. over any one part, to be free of aluminum and manganese, also free of railroad boxes, cocks and faucets, gates, pot pieces, ingots and burned brass.

7. Railroad Bearings:

Shall consist of railroad boxes or car journal bearings, must be old standard used scrap, free of yellow boxes, plastic and similar bearings, also iron-backed boxes, and must be free of babbitt; also free of excessive grease and dirt.

8. Cocks and Faucets:

To be mixed red and yellow, free of gas cocks and beer faucets; shall be at least half red.

9. Heavy Yellow Brass:

Shall consist of heavy brass castings, rolled brass, rod brass ends, brass screws and tinned or nickel plated brass tubing; to be free of iron and dirt and must be in pieces not too large for crucibles; no piece to measure more than 12 in. over any one part. Must also be free of aluminum and manganese mixtures. Condenser tubes shall not be considered as heavy brass.

10. **Light Brass:**

Shall consist of light sheet brass, forks and spoons, miscellaneous brass that is too light for heavy, but to be free of any visible iron, gun shells containing paper or iron, loaded lamp bases and of clock works.

11. **New Brass Clippings:**

Shall consist of the cuttings of new sheet brass to be absolutely clean and free from any foreign substances.

12. **Brass Tubing:**

Shall consist of brass tubing, free of nickel plating, tinned, soldered or tubes with cast brass connections. To be sound, clean tubes, free of sediment and condenser tubes.

13. **No. 1 Composition Turnings:**

To be free of aluminum, manganese, plastic and yellow brass turnings, not to contain over 2 per cent. iron, to be free of grindings or foreign material, especially babbitt, and free from adulterations made to resemble metal. Turnings not according to this specification subject to sample.

14. **No. 1 Yellow Brass Turnings:**

Shall consist of strictly rod turnings, free of aluminum, manganese, composition and tobin turnings. Not to contain over 3 per cent. of iron, oil or other moisture, to be free of grindings and babbitts. To avoid dispute, to be sold subject to sample.

15. **No. 1 Pewter:**

Shall consist of tableware and soda fountain boxes, but in any case must test 84 per cent. tin. Syphon tops to be treated for separately.

16. **Auto Radiators:**

To be classed separately, must be free of iron.

17. **Zinc:**

Must consist of clean sheet and cast zinc, also cast batteries to be free of loose oxide and dross, salammoniac cans and other foreign materials.

18. **Tin Foil:**

Shall consist of pure foil free of lead compositions and other foreign ingredients and matters.

19. **Electrotype Shells:**

Must be hand picked and free of dross.

20. **Packages:**

Shall be good strong packages, suitable for shipment, and each package to be plainly marked with the gross and tare weights so that when packages reach their destination, their weights can be easily checked.

When goods are not packed according to the above specifications and shipper wants his rejections returned, the cost of labor shall be charged to the shipper.

Penn Metal Company Absorbs Eastern Expanded Metal Company

The Penn Metal Company, 201 Devonshire street, Boston, Mass., has purchased from George P. Bullard the Eastern Expanded Metal Company, established 20 years ago. It had grown to be a large and successful concern and has always been the sole manufacturer of metal lath in the New England States. The Cambridge plant of the Eastern Company is to be greatly enlarged, and all the manufacturing equipment now used by the Penn Company is to be assembled there. The production of the well-known Lox-on tile, Penco shingles, Smooth Bottom culvert, Penco corner bead, and other specialties will be continued, but on a greater scale. The Penn Metal Company, under the management of George A. Sagendorph, has attained a large measure of success. This consolidation will make it the largest manufacturer of sheet metal products in the East. Mr. Sagendorph will be the chief executive of the new company and direct its policy, but Mr. Bullard still has a considerable interest and will assume the presidency.

The Beacon Miniature Electric Company, formerly located at 108-110 Duane street, New York, has found its new product, the Beacon Ideal fountain light, so popular that the increased business could not be properly taken care of in the old premises, and therefore the company has been compelled to move to larger quarters which are at 118-120 Duane street, within a short distance from the old location. This move was made in the very heart of the season for the sale of the company's products, thus demonstrating the urgent necessity for the change of base.

ELECTRIC DRIVE IN THE NAVY

Its Use to Be Extended—Oil as Fuel for All New Warships

WASHINGTON, D. C., December 26, 1914.—Commenting upon the performance of the collier Jupiter, which is the first vessel of any size in any navy equipped with electric propulsion, and which the Navy Department ordered from San Francisco to Puget Sound and from Puget Sound to Philadelphia through the Panama Canal, Secretary Daniels says in his annual report that the success of the trip affords "a remarkable demonstration of the efficiency of the electric drive and indicates clearly that electric propulsion must be considered hereafter in selecting the form of drive of naval vessels." In describing the electric installation of the Jupiter the secretary says:

In the majority of our ships, propulsion had previously been accomplished by means of reciprocating steam engines directly connected to the propeller shaft; but as the size of ships and their speed increased conditions arose which made it desirable to use turbines instead of reciprocating engines. The turbines also were directly connected to the propeller shafts, but in some cases the conditions to be met necessitated the use of propellers that were not as efficient as could be desired, and in all cases the turbine ships were far less efficient in backing than those that had reciprocating engines. The electric drive seems to offer advantages over either of the former systems sufficient to justify its trial on a scale large enough to demonstrate its suitability for ships of high power and great speed. The Jupiter installation is the result of this decision. It differs from the turbine installation in the fact that while a turbine is used to develop power it operates an electric generator instead of a screw propeller and the electric power thus generated is transmitted to motors on the propeller shafts in much the same manner as electric power is transmitted on shore. In other words, there is a central power plant composed of boilers, turbines, and electric generators, and the power is taken from this plant to the motors on the shafts. This installation possesses an advantage over the all-turbine drive in that it is not necessary to install a backing turbine, the reversing being accomplished through the motors, and with the same ease and certainty as prevail in any other electric motor installation, and with the further advantage over the all-turbine installation that full power can be utilized in backing.

The success that has thus attended the introduction of this new type of machinery is such that it was considered advisable to extend its use, and I have accordingly authorized its installation in the battleship California, which is to be built at the New York Navy Yard.

The test of the mechanical reduction gear which is being installed in the collier Neptune is expected to furnish valuable data for comparison with the electrical equipment of the Jupiter. The vessels are practically identical in construction except for the propelling machinery, and upon completion of the tests which the department has in contemplation, it will be possible to determine the relative merits of the two systems.

Each year marks more distinctly the passing of coal with its attendant discomfort and engineering and military inferiority as fuel for ships of war, Secretary Daniels states. Henceforth, all the fighting ships which are added to the fleet will use oil and the transition from coal to oil will mark an era in our naval development almost comparable with the change from black powder to smokeless powder for our guns. The ease with which oil can be handled, its superior steam-producing properties, the reduced number of men required for handling it and the decreased exertion required from the firemen, to say nothing of the ease with which the cleanliness of the ship can be maintained, all combine to make oil the ideal fuel for naval use. In this connection the secretary renews the recommendation of last year for legislation that will enable the Navy Department to purchase and refine its own oil drawn from wells on Government land "in order to relieve itself of the necessity of purchasing what seems fair to become the principal fuel of the navy in the future at exorbitant prices from private companies that may completely control the supply." W. L. C.

The Vilter Mfg. Company, Milwaukee, Wis., has received an order for a $50,000 refrigeration installation in the new municipal docks at Seattle, Wash. It will be in three units.

PERSONAL

President James A. Farrell of the Steel Corporation, President E. A. S. Clarke of the Lackawanna Steel Company, and George A. Post, president of the Railway Business Association, will be among the speakers at the annual dinner of the Buffalo Chamber of Commerce to be held at the Ellicott Club, Thursday evening, January 7.

Charles M. Schwab arrived in New York from Europe, December 23. Being interviewed on his arrival, he stated that the principal part of his business abroad was to cancel several contracts for the building of submarines, which he had obtained on a previous visit to Europe, in accordance with the law as explained to him by the Secretary of State. He further expressed himself as believing in a marked revival in business and commerce of all kinds in this country after the first of the coming year. He expressly stated that he did not predict any boom but a steady upward trend of business. He based his prediction of the return of prosperity partly on the fact that foreign governments have placed orders in this country for upward of $300,000,000 worth of goods to be delivered within the next year.

Frank C. Ayers, president and general manager of the J. C. Pearson Company, Boston, manufacturer of cement coated nails, will retire from the company January 1, 1915. He has been connected with it for 18 years.

Robert S. Alter, secretary American Tool Works Company, Cincinnati, Ohio, has returned from a six months' business trip to Europe.

John F. McCabe, superintendent of the galvanizing department of the Newport Rolling Mill Company, Newport, Ky., has resigned his position to take effect January 1. He built the galvanizing works for the company 20 years ago and has held the position of superintendent ever since.

J. W. Rose, Martinsville, Ind., has acquired an interest in the Anderson Foundry & Machine Company, Anderson, Ind., and it is understood he will become secretary and treasurer of the company.

Leonard J. Lewry, with the sales department of the American Rolling Mill Company, Middletown, Ohio, has returned from a several months' business trip to Europe.

George Yule, president Bain Wagon Company and interested in several other large manufacturing concerns in Kenosha, Wis., was stricken with paralysis December 22 at his winter home in Los Angeles, Cal. He is 90 years old and had arrived in Los Angeles from Kenosha only four days before the attack. In the past year he did not miss a day at his office. Hopes are entertained for his recovery.

A. A. Templeton, formerly vice-president of the Morgan & Wright Company, tire manufacturer, has acquired a large interest in the Detroit Seamless Steel Tube Company, Detroit, Mich., and has been elected its president.

Fred N. Baylies has been appointed Eastern manager of the P. & M. Company, with offices at 30 Church street, New York, effective January 1. He was formerly assistant sales manager of the Aluminum Company of America, with offices in Chicago, but has been a director of the P. & M. Company since its incorporation.

E. P. Crawford, president McKeesport Tin Plate Company, McKeesport, Pa., who was taken ill while in New York last week, was hurried home to Pittsburgh, where he underwent an operation for appendicitis in the Presbyterian Hospital. He is reported on the way to recovery.

J. W. Payne, formerly manager of the San Francisco office of the American Optical Company, has been added to the staff of T. A. Willson & Co., Inc., maker of eye protectors and goggles, Reading, Pa., as Pacific coast branch manager, with offices in the Head Building, San Francisco. This change, taking effect January 1, has been made with the idea of giving better service to the company's rapidly expanding coast trade. The company states that it can give excellent service abroad through S. Pulzer, 9 Hatton Garden, London, England, who carries a heavy stock of its styles for immediate delivery.

E. Carnegie, secretary-treasurer of the Electric Steel & Metals Company, Ltd., Welland, Ont., has been appointed vice-president and general manager of the company. He is a member of the recently appointed Shell Committee, which acts in an advisory capacity to the Minister of Militia and Defense, and is also a member of the Iron and Steel Institute and the Institute of Mechanical Engineers, England.

C. L. Hastings, formerly Pittsburgh representative for the Federal Graphite Company, Cleveland, Ohio, is now connected with the Pittsburgh office of the S. Obermayer Company, handling graphite.

James H. Cumming has been made vice-president and sales manager of the Warren Stamping Company, Warren, Ohio, which has taken over the Iddings Mfg. Company. George T. Fillius is president and W. T. Iddings is secretary and treasurer.

Fred B. Corey, formerly superintendent of tests and inspection for the Union Switch & Signal Company, has resigned and has opened an office at 404 Arrott Building, Pittsburgh. He will conduct a consulting engineering business, specializing on inspection.

D. M. Donnan, formerly of the service department of the Westinghouse Electric & Mfg. Company at East Pittsburgh, and more recently of the Boston district office of that company, has resigned to become manager of the Electrical Engineering & Mfg. Company, with offices in the First-Second National Bank Building, Pittsburgh.

Falling Off in Manganese Ore from India

Exports of manganese ore from India have been much cut down by the war. The following table shows a falling off of 49,545 metric tons in September from the shipments of September, 1913:

	September	
Destination	1913	1914
United Kingdom	17,950	5,730
Germany	1,900	....
Belgium	8,850	....
France	8,350	1,500
Japan	2,198	1,200
United States	23,127	4,400
Total	62,375	12,830

The greatest sufferer is shown to be the United States, the decrease being 18,727 tons.

Chattanooga By-Product Coke Ovens

The first battery of the Roberts by-product coke ovens, now under construction by the Chattanooga Gas & Coal Products Company, Chattanooga, Tenn., will consist of 12 ovens with a capacity for coking 500 tons of coal in 24 hours on a coking time of 7½ to 10 hours. It is expected that the plant will be in operation in May, 1915.

The organization is announced at Rio de Janeiro, Brazil, of a new firm styled Andrade, Giordano & Co., Ltd., at Avenida Rio Branco 137, for the importation of machinery, hardware, cement and other materials for construction. The firm announces that the senior partner has had long experience in this branch of business.

The shortage of automobile parts in England has become so acute that a meeting was arranged to be held in Birmingham, December 11, participated in by makers of steel castings, stampings, forgings and automobiles, and in charge of the Institution of Automobile Engineers.

The Michigan Stove Company, Detroit, Mich., has sent a letter to each of its employees offering him financial assistance until it is again able to give him work. The offer is limited to men who have been in its employ one year or more.

The Machinery Markets

Export buying of many kinds of machine tools continues good and with it is an unquestioned improvement in domestic sales and inquiries, especially the latter. The indications are that activity will be at least fair as soon as 1915 gets into motion. It is felt that a few weeks must elapse before increased railroad buying is materially felt. Sales for export continue the feature in New York, though a betterment in domestic demand is in evidence. New England manufacturers have received a flood of inquiry much of which is traceable to war needs. Detroit shows improvement in inquiry and the outlook is encouraging. Cleveland sellers report a betterment, despite the holidays, due to increased inquiry and a fair run of single tool orders. Domestic inquiry is increasing in Cincinnati and export orders continue to come along, the specifying of quick deliveries being the only drawback. In Milwaukee foundries operated on Christmas day to make quick deliveries. The Central South shows a disposition to postpone purchasing until after January 1, but a good indication is that mills and factories are operating on a normal schedule. Texas has been dull as a result of the holidays and bad weather. Tentative inquiry continues to accumulate in St. Louis and forecasts activity after January 1; meanwhile the daily average of trade was maintained through the holidays. In the Pacific Northwest financial conditions are better and heavy building and municipal projects are contracted for or planned.

New York

NEW YORK, December 30, 1914.

While selling for export continues the leading feature of the market, not less important is the fact the domestic demand is on the mend, evidence of which is seen not only in good inquiries, but in sales as well. A New York company which sells abroad reports a steady run of sales, one of which called for 30 milling machines. Through Austin, Baldwin & Co., 116 Broad street, New York, a number of lathes, grinders and other machines have been purchased and the company is inquiring for more tools. All are for export to France and are what may be called shrapnel-making equipment. The Traylor Engineering & Mfg. Company, Allentown, Pa., has asked for estimates on a large quantity of shrapnel-making equipment, the purchase of which is understood to be contingent on the company receiving an order for shrapnel cases for the British government. A representative of the company is now abroad. The trade is anticipating the large orders which are to be placed for the new plant of the Remington Arms Company, Bridgeport, Conn.

Though it is early yet to expect any great material benefit from the freight rate decision recently handed down, it has caused the machine tool trade to be greatly encouraged and they attribute inquiries just received from two railroads to the influence of the favorable decision.

The Beckley Perforating Company, Garwood, N. J., is in the market for several double-column or arch presses, strongly built for heavy stamping and perforating work; heavy flanging machines, universal miller, horizontal surface grinder for surfacing small castings, shears and punching presses. The company is now running its plant until midnight and will have to continue to do so for the next three months or more on present orders.

It is announced that Thomas A. Edison, Inc., Belmont avenue, Silver Lake, N. J., is to rebuild at once its plant situated at Lakeside avenue and Valley road, West Orange, N. J., at a cost of from $750,000 to $1,000,000. Several propositions are now under consideration.

Jacob Ruppert, brewer, Third avenue and Ninetieth street, New York City, will erect an 11-story brewery on Ninety-second street, between Second and Third avenues, on a plot 75 x 115 ft. Maynicke & Franke, 25 East Twenty-sixth street, New York, are the architects.

The Curtiss Aeroplane Company, Hammondsport, N. Y., has taken over a portion of the old plant of the E. R. Thomas Motor Car Company, 1190 Niagara street, Buffalo, N. Y., and is installing equipment to manufacture two machines a day. Equipment will be added as needed. The Curtiss Motor Company, Hammondsport, N. Y., which is also owned by the same interests, but is independent, will continue the manufacture of aeronautical motors on a much larger scale. J. H. McNamara is superintendent of the latter company.

The American Piston Ring Company, 378 Jelliffe avenue, Newark, has had plans drawn for a one-story brick factory, 75 x 106 ft., to be erected on South Eleventh street, near Avon avenue, at a cost of $10,000. It will need ½, 1 and 5-hp. motors. Jordon Green, 27 Clinton street, Newark, is the architect.

The Brooklyn Foundry Company, Boulevard and Orchard streets, Astoria, Long Island, N. Y., has reduced its capital stock from $100,000 to $25,000. Operations will continue as before. Andrew N. Petersen is president.

The Bauer Chemical Company, 30 Irving place, New York City, has let the general contract to Bennett & Butts, Oneonta, N. Y., for a food tonic factory, to be erected at Oneonta. It will be 45 x 62 ft., two stories, 42 x 82 ft., one story, with a power house 44 x 45 ft., one story.

Wilford Hall, Port Chester, N. Y., is having plans prepared for a laboratory 80 x 200 ft., two stories, to cost approximately $25,000.

Work has been started on the creamery and dairy 40 x 112 ft., two stories, and boiler house 40 x 80 ft., one story, of brick and steel, to be erected at Oneonta, N. Y., by the Sheffield Farms, Slawson Decker Company, Hobart, N. Y.

The H. E. Hessler Company, 512 North Salina street, Syracuse, is taking bids for a two-story addition to its sheet metal works, 35 x 80 ft.

The Hydraulic Turbine Corporation, Camden, N. Y., recently incorporated, will call for bids for the construction of a plant for the manufacture of turbine machinery. The main building will be 50 x 300 ft., one story, with ell 50 x 300 ft., and will cost about $200,000. Russell S. Johnson, City National Bank Building, Utica, N. Y., is president, and Isaac D. West, general manager.

The Buffalo Lounge Company, Buffalo, is building a four-story addition to its factory at Hamburg street and the Erie Railroad.

J. W. Goddard & Sons, Inc., Smithtown, N. Y., has been incorporated with a capital stock of $250,000 to manufacture textiles. It will build a factory. C. E. Lang, C. H. Brewster and T. Roberts, Jr., New York City, are the incorporators.

The Lawler Iron Works, Buffalo, has been incorporated by James J., J. J., Jr., and H. C. Lawler, with a capital stock of $20,000. It has acquired the foundry and machine shop formerly occupied by the Riverview Bronze Company at Gull street and the New York Central Railroad Belt Line (Inc.), and will equip it for the manufacture of gray iron castings.

The Atlas works of the Standard Oil Company, Buffalo, will add a one-story steel storehouse, 55 x 147 ft., to its plant at Elk street and the Buffalo Creek Railroad.

The G. W. Brownyard Company, Inc., Rochester, N. Y., has been incorporated with a capital stock of $50,000 to manufacture fireproof doors and windows. G. W. Brownyard, 267 Mill street, is president.

Henry L. Morlock, 994 East Seneca street, Buffalo, will build a one-story brick factory at Babcock street and the Lehigh Valley Railroad for the manufacture of varnish products. Most of the machinery needed has been contracted for.

Bids are being taken by the city of Sheridan, N. Y., for the construction of a new pumping station.

The Chautauqua Radiator Company, Jamestown, N. Y., recently incorporated, plans a factory. W. N. Schumer, H. M. Gersman and H. J. Hopkins, Buffalo, are the directors.

Watervliet, N. Y., has filed with the State of New York an amended application for the city's new waterworks. The additional features called for will cost $125,000, including a filtering plant to cost $50,000.

The Jamestown Gas Radiator Company, Jamestown, N. Y., has been incorporated to manufacture gas stoves and heating apparatus by W. N. Schumer, H. M. Gersman and H. J. Hopkins, 540 Potomac avenue, Buffalo, N. Y.

New England

BOSTON, MASS., December 29, 1914.

The experience of two representative manufacturing houses in the 10 days preceding Christmas may have significance in its bearing on the business outlook. One manufactures abrasive wheels, the other drop forgings. Independent inquiry as to the conditions of affairs, as these firms had found them, received practically identical answers. For some reason the 10 days had brought in a large amount of new business, constituting a sharp increase in total sales. It came from a wide range of customers, many through the nature of their products wholly separated from materials of war. With the forge concern, some business had been pending, and was therefore not unexpected. A material part of the increased demand was, however, absolutely new; and is regarded as encouraging for the future.

The machine-tool people hear from their dealers that several lists of tools are being figured for Southern railroads. One large manufacturer of railroad supplies has been buying a nice lot of machinery. Auto truck builders have purchased tools, among the buyers being the Locomobile Company of America for its shops at Bridgeport, Conn. These orders are traceable to European business. Manufacturers of grinding machines report a large, unexpected influx of inquiries; in fact, in at least one case the volume of inquiries is so great as to put office and engineering forces under actual strain. Here, also, munitions of war figure less than domestic needs. Automobile manufacturers are active in these promised purchases. Increased inquiry is not confined to grinding machines. It is reported from various other lines of the industry. The absorption of engine lathes continues, with quick delivery always an imperative condition. The country's supply of lathes is getting lower continually, in spite of the fact that some of the builders are replenishing their stocks.

The wire business in Worcester is improving slowly. This is true of both the works of the American Steel & Wire Company and of the independent companies. On the other hand, there are weak spots in the general industrial field. The general trend is probably toward improvement. A real buying movement on a moderate scale would be no surprise. Prices are low. Some users of steel of the higher grades are either placing orders, taking care of their requirements for some months to come, or are studying the situation carefully with this purpose in mind.

The business of Sleeper & Hartley, 100 Beacon street, Worcester, Mass., manufacturers of wire spring and other special wire-forming machinery, has been incorporated as Sleeper & Hartley, Inc. F. H. Sleeper is president; G. D. Hartley, treasurer, and W. H. Blount, the third director.

The works of Smith & Wallace, Woburn, Mass., manufacturers of electric railroad equipment and supplies, suffered a loss of $25,000 by fire December 27. The planing mill, with its equipment of wood-working machinery, was burned, together with a building devoted to the erection of rotary snowplows, derrick cars and maintenance cars.

The shops of the Samuel Smith Machine Company and the Standard Shoe Machinery Company, Lawrence, Mass., were badly damaged by fire, December 26, the loss being estimated at $20,000.

The Hartford Rubber Works, Hartford, Conn., manufacturer of tires and now employing 1000 hands, proposes to double its capacity soon after the New Year. The present buildings permit of the enlarged output.

Philadelphia

PHILADELPHIA, PA., December 28, 1914.

The Berg Company, Ontario street, below Richmond, Philadelphia, Pa., manufacturer of fertilizers, has been granted a permit for the erection of a two-story factory, 50 x 100 ft., of brick and concrete, for the Animal Oil Company, a subsidiary, to cost $12,000.

The Hart Chemical Corporation, Easton, Pa., will erect a factory for the manufacture of potash and other chemicals. Edward Hart is president, and Charles Ingraham, secretary.

The Thomas Kern Lumber Company, Slatington, Pa., has been incorporated with a capital stock of $40,000 by A. J., Franklin and R. E. Kern, to manufacture lumber, etc. It succeeds Thomas Kern, lumber dealer, etc., and is fully equipped.

The Darling Pump & Mfg. Company, Ltd., Williamsport, Pa., has completed a foundry, at an estimated cost of $20,000.

Chicago

CHICAGO, ILL., December 28, 1914.

Anticipation of inquiry and orders from the railroads whetted by the announcement of a favorable rate decision is as yet unrewarded. Except for a few orders for special tools, which are reported as having been under consideration for some time, new business in that direction is still backed up. The holiday season also accounts in large measure for the limited interest on the part of industrial interests. We note the purchase of a few small drills and lathes, several inquiries for second-hand machines and a fair demand for electrical machinery.

One of the machine shops of the Illinois Iron & Bolt Company, Carpentersville, Ill., was damaged by fire December 22, causing a loss of about $40,000. The major portion of the machine shops are intact and no suspension of operations will be necessary. J. F. Fierke is president.

The Joy Engineering Company, Chicago, has been incorporated with a capital stock of $20,000 to manufacture and deal in specialties, machinery, etc. The incorporators are P. L. Stockburger, R. L. Donahue and L. L. Smith.

The Plowman-Solitt Company, Chicago, has been incorporated with a capital stock of $5000 to manufacture and install reflectors, lighting fixtures, electrical specialties, etc. Albert G. Miller, S. B. Hill and William Scott Stewart, 69 West Washington street, are the incorporators.

The plant of E. A. Rysdon & Co., manufacturers of sheet metal, 527 West Forty-first street, Chicago, was damaged by fire.

The Thermo Electric Regulator Company, Chicago, has been incorporated with a capital stock of $5000 by Guy J. Powell, Lee P. Hynes, 7320 Princeton avenue, and William G. Hartwig to manufacture and deal in electric appliances and equipment for thermostatic heat control.

The Burson Steel Stud Company, Chicago, has been incorporated with a capital stock of $35,000 to manufacture and deal in steel studding and fireproof material. The incorporators are E. E. Fletcher, N. A. Hansen and C. M. Felten.

The Kohler Die & Specialty Company, DeKalb, Ill., has let the contract for the building of the foundation for its new factory.

The American Pure Water Company, Jacksonville, Ill., has been incorporated to manufacture, sell and lease machines and appliances for purifying water. The incorporators are L. C. Lashmet, C. S. Richards, Johas Lashmet.

The board of trustees of Peoria Heights, Ill., has voted final approval of a waterworks system. The plan calls for an expenditure of $67,000.

Larned, Kan., will receive bids until January 18 for two motor-driven pumps, one 125 and one 150 kw., direct-connected units and electric distributing system. Worley & Black, Kansas City, Mo., are the engineers.

The factory of the Northwestern Needle Company, Minneapolis, Minn., will be moved to Huntington, Ind., where it will operate under the name of the United States Needle Company. The concern has been purchased for approximately $100,000 by a syndicate of Chicago and Indiana capitalists headed by Charles E. Johnson, Chicago.

The National Brass Company, Grand Rapids, Mich., has built an addition to its factory to double its capacity.

The Biggs Mfg. Company, St. Paul, Minn., has been incorporated with a capital stock of $250,000 to manufacture calendar threading and glueing machinery. The incorporators are Peter Van Hoven, J. C. Martin, Charles Richter and James C. Michael.

T. F. Hudson, representative of the Johnson Electric Smelting Company, Keokuk, Iowa, has stated that work on the construction of the company's buildings probably cannot be started before March 1. Bids for contracts will be received within a short time.

The Baker, Coleman & Carroll Company, a new concern which will manufacture garden plows, will build a factory in Shenandoah, Iowa.

The Aetna Powder Company will enlarge its plant east of Gary, Ind., for the purpose of manufacturing chemicals such as have heretofore been imported from Europe.

The electric light plant of the Worland Light & Power Company, Worland, Wyo., has been burned.

The Warner Fence Company, Pueblo, Colo., is planning to install additional fence weaving machines to double the capacity of its plant.

Dusenberg Brothers, St. Paul, Minn., have opened their new motor building plant. Among orders is one for building 200 aeroplane motors for Russia and France, both of which nations have made requests for early shipments.

Detroit

DETROIT, MICH., December 28, 1914.

This week has shown very little activity in machinery circles, but as business is always considerably below normal during the holidays, no significance is attached to this condition. Some improvement is noted in inquiry, and dealers are encouraged over the outlook. There seems to be no question but that considerable business will develop after January 1. General conditions in the metal-working trades show a slight improvement.

The Winckley Company, Detroit, manufacturer of metal specialties, is erecting a one-story addition to its plant.

The Republic Motor Truck Company, Alma, Mich., has acquired an additional building and will enlarge several of its departments.

The Christy Account Register Company, Menominee, Mich., has been incorporated with $25,000 capital stock and will engage in the manufacture of account registers. Jerry Madden, H. A. Vennema and Nicholas May are the incorporators.

W. J. Chesebrough and R. E. Chesebrough, Detroit, have organized the Willwin Lumber Company to develop timber and quarry properties in northern Michigan. A sawmill will be erected.

The Illinois Envelope Company, Kalamazoo, Mich., operating a plant for the manufacture of envelopes, has been reincorporated, adding $100,000 to its capital stock. An additional factory is planned.

Fire following an explosion did about $10,000 worth of damage to the plant of the Alpena Gas Company, Alpena, Mich. Part of the machinery was saved.

Milwaukee

MILWAUKEE, WIS., December 28, 1914.

For the first time in several years, Milwaukee witnessed the interesting spectacle of several large foundries operating on Christmas day, and the equally unusual proceeding of several big machine shops operating through the holiday week except on Christmas. The reason is not any great rush of business; but a quick production of the recent bookings, small as they are. Employers hope to start the new year with increased forces, but no additions will be made until business warrants it. The railroad rate increase has created a much improved spirit. Immediate business is very quiet, and nothing of consequence is anticipated until after January 1.

The LaCrosse Plow Company, LaCrosse, Wis., has increased its capital stock by $300,000 to provide a greater working capital. The common issue is increased from $400,000 to $500,000, and the preferred from $200,000 to $400,000. A. Hirshheimer is president.

The Universal Motor Company, Oshkosh, Wis., has been incorporated with $25,000 capital stock to take over the business of Termaat & Monahan, makers of engines and machinery. J. D. Termaat, L. J. Monahan and A. B. Dye are the corporators.

The Pirate Motor Mfg. Company, Milwaukee, has been incorporated with a capital stock of $50,000 by Herman Roth, Julius Tanck and John Krohn.

The Wisconsin Railway Commission has authorized the New Richmond Power Company, New Richmond, Wis., to issue $10,000 additional stock to purchasing additional electrical equipment, etc.

The Federal Rubber Mfg. Company, Cudahy, Wis., is having plans made for a factory addition of brick and mill construction, 44 x 124 ft.

The Koban Mfg. Company, 241 South Water street, Milwaukee, manufacturer of detachable rowboat motors, has increased its capital stock from $25,000 to $75,000 to provide larger working capital and extensions planned for the coming year. Otto J. Koch is president.

The A. W. Schram Mfg. Company, Oshkosh, Wis., has been incorporated with a capital stock of $100,000 by Thomas Meany, G. H. Young and P. D. Cloud.

The Farmers' Co-operative Packing Company, Wausau, Wis., will lay foundations for its proposed $250,000 mill, elevator and cold storage plant. Already $100,000 has been paid in, and the work will be pushed to completion. Contracts for the superstructure and equipment will be let about February 15 or March 1. D. Sauerhering is president.

The Davis Mfg. Company, Fifteenth avenue and Park street, Milwaukee, is preparing to push work on its new plant at Fifteenth avenue and Burnham street, West Allis. Plans for the machine shop will be completed by the engineers within a few days.

The A. R. Schmidt Electric Company, Milwaukee, has been incorporated with a capital stock of $25,000 to take over the electrical manufacturing and supply business of Albert R. Schmidt, 262 East Water street. O. J. Reuss and John Beuer are associated with Mr. Schmidt in the new corporation.

The Lancaster Electric Light & Power Company, Lancaster, Wis., has been authorized by the Wisconsin railway commission to issue $34,731 in stock for the purchase of power and transmission lines between Platteville and Lancaster, Wis.

Articles of incorporation have been filed by the Manitowoc Electric Implement Company, Manitowoc, Wis., to manufacture electric appliances and devices. The capital stock is $25,000 and the incorporators are G. C. and Joseph Brunner and Frank Brixius.

Cleveland

CLEVELAND, OHIO, December 28, 1914.

Some dealers report an improved volume of business, which was unexpected during the holiday season. A fair amount of single tool orders was placed the past week. An improvement is seen in small inquiries. The feeling in the machinery trade is better, and a more active buying movement is looked for early next year. At present not much business that might result in the placing of round lot orders can be found. So far, the only effect of the railroad rate decision is a sentimental one. Little, if any improvement, is expected in the demand from railroads for the next 60 days. Manufacturers in metal making lines look for a better volume of business after January 1. The foundry trade shows a little improvement.

The Standard Welding Company, Cleveland, has increased its capital stock from $1,600,000 to $2,250,000 to provide for increased business.

The F. J. Erney Mfg. Company, Cleveland, has been incorporated with a capital stock of $5000 by F. J. Erney, J. H. Folk, Jr.; A. A. Latten, and others, to manufacture automobile lamps.

Sealed proposals will be received at the office of the commissioner of purchases and supplies, Cleveland, January 8, for service switches for the municipal electric light plant.

The Metals Welding Company, Cleveland, has increased its capital stock from $50,000 to $75,000 and will enlarge its plant on Perkins avenue by the erection of an addition 35 x 130 ft.

The Morgan Lithographing Company, Cleveland, expects shortly to begin the erection of a plant 170 x 250 ft., of brick and fire-proof construction. It has acquired a site on Payne avenue.

The Bucyrus Electric Light & Power Company, Bucyrus, Ohio, is having plans prepared to double its present capacity.

The Ohio Road Machinery Company, Oberlin, Ohio, has under consideration the re-organization of the company with an increase in capital stock from $40,000 to $100,000 in order to increase the volume of its business.

The Serpentine Mfg. Company, manufacturer of house heating equipment, Marion, Ohio, has under consideration the removal of its plant to Kenton, Ohio, where it may buy a site and erect a plant, or secure a building already erected.

It is announced that the Canton Sheet Steel Company and the Canton Corrugating Company, Canton, will enlarge their plant and install considerable new machinery.

The Massillon Chair & Desk Company, Massillon, Ohio, has been formed with a capital stock of $300,000 by Louis P. Mauger and others to manufacture chairs for theaters, picture shows, etc., and school desks. It expects to build a plant 100 x 250 ft.

Cincinnati

CINCINNATI, OHIO, December 28, 1914.

In spite of the holiday season a number of inquiries are coming in from domestic sources for different kinds of machine tools. Only a limited number of orders have been placed lately in this country; but the increasing demand is considered very encouraging. The railroads have as yet shown no signs of putting out lists at any early date, although business from this source is looked for early after January 1. As far as can be ascertained no local manufacturers were benefited by the large purchases of equipment and machinery reported by the daily press to have been made by the Illinois Central Railroad last week. It is generally believed locally that this announcement was premature.

The export business continues to pour in, and as far as medium-sized engine and turret lathes are concerned quick delivery is the only drawback. It is understood that all machines now being shipped to Europe are paid for before leaving New York, except in a few instances where old customers are concerned. Vertical milling machines are in good demand.

Manufacturers of large electrical equipment are winding up a very unsatisfactory year; but small generators and motors have been steady sellers, practically throughout the entire past 12 months. The wood-working machinery business is showing some improvement.

The Cincinnati Iron & Steel Company, Cincinnati, reports the shipment last week of two carloads of Cisco lathes to a customer in Italy, making the third order from this source since the war began. It is also preparing a large shipment for England.

It is reported that the Dayton Power & Light Company, Dayton, Ohio, will purchase the plant of the Cedarville Light & Power Company, Cedarville, Ohio, and enlarge it.

The Kropp Shoe Company, Columbus, Ohio, has been incorporated with $150,000 capital stock by William Kropp and others. It plans to fit up a shoe factory. Machinery requirements are not yet known.

The Jones Heel & Mfg. Company, Columbus, Ohio, has increased its capital stock from $30,000 to $75,000, and will make some additions to its plant.

The American Show Case Company, Columbus, Ohio, has been incorporated with $35,000 capital stock by E. W. Martindale and others.

The Ashland Foundry Company, Ashland, Ohio, has increased its capital stock from $20,000 to $32,000. It is not known what additions to its plant are planned.

The Pattin Brothers Company, Marietta, Ohio, is moving its foundry from Second street to its new plant in East Norwood, a Marietta suburb.

The plant of the Papa-Glair Wood Products Company, Creston, Ohio, was destroyed by fire December 21, entailing a loss of about $20,000, partially covered by insurance. Rebuilding plans have not yet been announced.

The Central South

LOUISVILLE, KY., December 28, 1914.

A disposition to put off buying until after the first of the year is strongly in evidence. The improvement in the cotton situation is sure to help business all over the South. The demand for woodworking equipment is increasing, as many sawmills, planing mills and furniture factories, which have been closed or operating on short time, are resuming a normal schedule. Prospects are reported by machinery houses to be satisfactory.

Local machinery houses observed a triple holiday at Christmas, for the most part, few doing business on Saturday, December 26. This was partly because of quiet business conditions, and partly as the result of a general movement which was started for the purpose of enabling employees to secure three consecutive days of leisure. The plan was also followed by most of the manufacturing and jobbing houses of the city, and the business district December 26 had a deserted appearance.

The Ford Motor Company, Detroit, has submitted plans for its Louisville assembling plant. It will be six stories, of reinforced concrete, and will occupy a site containing 20,000 sq. ft.

The J. F. Kurfees Paint Company, Louisville, is having plans for a plant drawn by Joseph & Joseph, Louisville, and will build the coming spring.

The W. T. Pyne Mill & Supply Company, Louisville, is reported in the market for additional motors.

The Louisville Bridge & Iron Company, which has been considering changing its motors from direct to alternating current, is reported to have decided on the change, and will be in the market for several hundred horsepower in motors.

The Reliance Textile & Dye Works, Covington, Ky., has plans for the enlargement of its dyeing and finishing plant at a cost of $25,000.

E. M. Howard, Harlan, Ky., has information regarding the establishment of a waterworks plant.

The Lancaster Parquet Flooring Company, Paducah, Ky., has established a plant for the manufacture of fancy hardwood flooring.

J. W. Smith, Winchester, Ky., and A. J. Conn, Louisville, Ky., plan the establishment of an ice factory at Irvine, Ky.

A. A. Jackson, Winchester, Ky., plans to establish a factory for the manufacture of a patented garbage can.

W. D. Coleman, Brandenburg, Ky., has purchased an electric light franchise and will install a street lighting system in about 30 days.

White L. Moss, Pineville, Ky., is general manager of a new company which will develop coal property at Hemphill, Ky. A plant with a capacity of 1200 tons a day will be installed.

S. J. Gish, Central City, Ky., is reported to plan erecting an ice factory with a daily capacity of 20 tons, etc.

Sebree, Ky., will sell $14,000 of bonds January 4 for the construction of a waterworks system.

H. W. Brennan, Memphis, Tenn., is organizing a company to build a cotton mill. The proposed enterprise will be capitalized at $1,500,000.

The plant of the Hice Mfg. Company, Johnson City, Tenn., recently burned, will be rebuilt. It will purchase an engine, a generator of about 250 kw. capacity, and about 30 motors, and spoke manufacturing equipment. Used machinery will be considered. J. W. Hice is general manager.

The Maryland Monument & Marble Company, Maryland, Tenn., is in the market for a lathe and a planer, for metal-working, both second-hand.

The Rowe Brothers & Son Company, Hampton, Va., is in the market for a 15-hp. upright engine.

I. A. Stainaker, Buckhannon, W. Va., plans the erection of a feed mill and elevator.

The Great Southern Lumber Company, Bogalusa, La., has announced plans for a $1,000,000 by-products plant for the manufacture of rosin, etc., in connection with its sawmill. Its paper mill is to be remodeled. W. H. Sullivan is general manager.

St. Louis

ST. LOUIS, MO., December 28, 1914.

Business was of necessity light through the holiday week; but the daily average for the four operating days was reasonably good. Minor demand for mechanical equipment of all classes is quite active. Tentative inquiry continues and indicates a steady increase in business after the first of the year. Money is relatively easy, and new enterprises are encouraged to go ahead. Collections are reported good. Second hand machinery is dull.

The Sanitary Package Company, St. Louis, has been incorporated with a capital stock of $15,000 by F. L. Davis, Webster Groves, Mo.; A. J. Fitzsimmons, E. N. and G. M. Walker, St. Louis, to manufacture wood and fiber packing cases.

The International Mfg. Corporation, St. Louis, of which S. L. Wagley, 2008 Locust street, is president, is in the market for high pressure tanks, engines, etc.

The Hennes-Reichert Iron Works, St. Louis, Mo., has been incorporated with a capital stock of $12,000 to do a general iron and steel manufacturing business. The incorporators are Albert R. Hennes, Charles J. Reichert and Frederick G. Schreck.

The Heimbuecher Metal Products Company, St. Louis, Mo., has been incorporated with a capital stock of $5000, to do a general metal products business. William C. Heimbuecher, John H. Heimbuecher, A. Nupert and M. C. Heimbuecher are the incorporators.

Fire did about $2500 damage to the factory of the Letts Box Company, St. Joseph, Mo.

The Allen Cooperage Company, Kennett, Mo., has been incorporated with a capital stock of $50,000 by W. D. Lasswell, L. N. Allen and L. B. Erwin, and will establish a mill.

The Bradley Lead & Zinc Company, Chitwood, Mo., of which S. M. Bradley, Morehead, Ky., is president, will install two 110-hp. gas engines and compressor, one 125-hp. boiler, etc.

The plant of the Missouri Can Company, Kansas City, Mo., which burned with a loss of $75,000, will be rebuilt.

The mill of the Quercus Lumber Company, Poplar Bluff, Mo., has been destroyed by fire with a loss of $40,000. It will be rebuilt.

The Missouri, Kansas & Texas Oil & Gas Company, Holden, Mo., has been incorporated with a capital stock of $500,000 by W. R. Affeld, Emery Thompson, G. S. Young and E. O. Affeld. It will construct a pumping plant with a capacity of 20,000 bbl. daily and is in the market for refining equipment, oil and gas well supplies, power plant equipment and accessories. W. R. Affeld, Holden, Mo., is in charge.

The Cheney-Hughes Gas & Oil Company, 205 Fidelity Trust Building, Kansas City, Mo., will receive bids until January 22 for a gas pumping plant to be equipped at Claremore, Okla.

A plant for the manufacture of a patent plow will be established by W. H. Harp, Bergman, Ark., and others.

The Auto Service & Supply Company, Eureka Springs, Ark., has been incorporated with a capital stock of $14,000 by F. B. and B. M. Stowe and J. A. and E. E. Monagan.

The Fort Smith & Western Railroad, Ft. Smith, Ark., will expend about $80,000 to increase the capacity of its machine shops. A. L. Mills, the general manager, should be addressed.

Texarkana, Ark., has authorized the equipment of a waterworks plant, etc., at a cost of about $500,000. The mayor is in charge.

The Cushing Light & Power Company, Cushing, Okla., will install equipment to cost about $30,000, including generators, power plant, etc.

Red Rock, Okla., will build an electric light system and a waterworks plant to cost about $30,000. The Benham Engineering Company, Oklahoma City, Okla., is preparing the plans.

The Sapulpa Ice Company, Sapulpa, Okla., will increase the capacity of its plant 80 tons a day.

The Blue Blaze Heating Company, Clinton, Okla., has been incorporated with a capital stock of $10,000 by R. H. Thompson, Albert Davidson and W. J. Nicholson to manufacture a patent gas burner.

A garage is being installed at Henryetta, Okla., by Joseph Bryant and others.

The Clinesmith Motor Company, Wakita, Okla., has been incorporated with a capital stock of $15,000 by F. L., John and William Clinesmith and will establish a machine shop and garage.

The Tulsa Furniture & Fixtures Company, Tulsa, Okla., has been incorporated with a capital stock of $14,000 to manufacture furniture, etc. Stanley Chastain is president and manager.

The cotton compress at Hugo, Okla., of the International Compress Company, Paris, Texas., which has been burned with a loss of $125,000, will be replaced at once.

Bids will be received until January 5 by the city of Plaquemine, La., for a waterworks plant to cost about $42,000. G. A. Rees, Shreveport, La., is engineer in charge. L. B. Le Blanc is city clerk.

P. F. Chatelain, Plaucheville, La., is receiving bids on shingle mill machinery, including a power plant of 100 hp. capacity, etc.

The Boydston Mower Company, Nachitoches, La., is in the market for the equipment for the manufacture of a new type of mower.

The Tropical Ice Company, Q. and C. Building, New Orleans, La., of which James Vaccaro is president, will install ice-making equipment of 200 tons daily capacity. Car cooling equipment is also wanted.

An oil refinery is to be equipped at Baton Rouge, La., by H. F. Sinclair and P. J. White, Tulsa, Okla., with a daily capacity of 30,000 bbl. It will begin as a splitting plant, adding stills, etc., as needed. A pumping plant, etc., will also be installed.

A metal welding plant will be equipped at Lake Charles, La., by the Temple Welding Company, Temple, Tex.

The Port Commissioners of New Orleans, La., have awarded the contract for the construction and equipment of a cotton compress and warehouse to cost $1,400,000 to the Jefferson Construction Company, New Orleans, La., which will let sub-contracts for the mechanical equipment.

Texas

AUSTIN, TEXAS, December 26, 1914.

The holiday season and bad weather contributed to the dullness of the machinery and tool trade. It is estimated that about 50 per cent. of the cotton crop has been marketed. The remainder will be held for better prices.

The plant of the Conroe Gin, Ice, Light & Power Company, Conroe, destroyed by fire recently, will be rebuilt.

L. Strickland & Son, Cumby, will build a cotton gin to replace one recently destroyed by fire.

The Texas Anchor Fence Company, Ft. Worth, has begun the erection of its new fence factory.

The F. A. Ryon Lumber Company, Manning, will build a saw mill with a daily capacity of 25,000 ft.

It is reported that the Houston & Texas Central Railroad plans to construct new repair shops and roundhouse at Hempstead.

A new waterworks plant and distributing system is to be constructed at Killeen. Patrick Bracken is superintendent of construction.

The Mexican Consolidated Mining & Milling Company plans to construct an electric power plant at Guanacevi, Durango, Mexico. It will also install drainage pumps.

The National Brass Company, Houston, has been organized with a capital stock of $20,000. G. F. Cotter is one of the owners.

The Pacific Northwest

SEATTLE, WASH., December 23, 1914.

Dealers report light business through the holidays; but belief that 1915 will show marked change for the better in financial and business circles is universal. Financial conditions are easier. A number of orders placed for early delivery indicate that construction work will be heavy at the close of winter. An unusually large amount of building is contracted for in Oregon and Washington to start after January 1. Many municipal projects will be taken up and put through in the early spring.

Several substantial orders have been placed in Seattle for mining machinery for early delivery. Much repair work is being done at present. All the steamship companies are having their vessels overhauled.

Shepherd & Brock, attorneys, Portland, Ore., representatives of the Jason Moore Company, New York City, announce that it plans the construction of chemical plants and a power plant near Portland. Preliminary plans have been prepared by J. G. Kelley, engineer, Chamber of Commerce Building, Portland.

The Modern Box Mfg. Company, St. Maries, Idaho, will begin the construction of a box factory to cost about $30,000. Frederick Wooden and E. A. Knight, Spokane, Wash., are among the principal stockholders. The company plans building a similar plant at Boise.

The Seattle Construction & Dry Dock Company, Seattle, has been awarded contract for repairs to the steamship Northwestern of the Alaska Steamship Company. The work includes converting the vessel into an oil burner at a cost of $60,000.

The Bay City Storage & Fisheries Company's cannery at Bay City, Ore., was destroyed by fire recently, with a loss of about $25,000.

The White Pine Sash Company, Spokane, Wash., has converted $50,000 of preferred stock into common stock, to provide additional capital for improvements to its plant.

The Big Bend Machinery & Supply Company, Ritzville, Wash., has been incorporated with a capital stock of $10,000 by C. W. Rathbun and P. R. Clark.

The Stetler Box Factory, Portland, Ore., is negotiating for a site on which it will erect a brick factory building, 100 x 200 ft., to cost $50,000 complete.

Arrangements are practically completed for the construction of a factory in Portland, Ore., by L. F. Simpson, to manufacture a patented automobile signaling device. The Commercial Club, Portland, is co-operating.

The Beattie McClelland Shingle Mill, Ridgefield, Wash., has completed plans for remodeling its mill into a public service lighting plant, for which a franchise has been granted.

L. Y. Stayton, 510 California Building, Tacoma, Wash., plans the construction of a reinforced concrete pile manufacturing plant near Seattle to cost about $250,000.

H. H. Edmonds, Klamath Falls, Ore., and others, will build a sawmill at Olene. A small part of the machinery has already been purchased.

A company, headed by I. W. Taylor, Toledo, Wash., has been formed to erect a plant for the manufacture of a patented paving block. A factory will be built at Eatonville, on the Tacoma Eastern Railway.

The Molander-Hawaiian Power Company, Tacoma, Wash., has been incorporated, with a capital stock of $250,000, by G. C. Bratt, H. A. Frauens and Samuel Cassimer.

The City Council, Tacoma, has authorized the commissioner of public safety to purchase one 24-in. x 12-ft. engine lathe for the city machine shop, and has appropriated $1000 for this purpose.

A patented window ventilator will be manufactured by a company of which C. A. Barr, Eugene, Ore., is one of the principals.

Western Canada

WINNIPEG, MAN., December 26, 1914.

No important contracts have been placed the past week, and the demand for machinery parts has been slow. Little change is looked for in the next few weeks. A frosty spell is retarding outside work. Spring operations are without feature, and industrial development will probably be quiet in comparison with previous years.

A. J. Waskett, Port Alberni, B. C., will erect a shingle mill to cost $25,000.

The Eureka Lumber Company, Ltd., Elko, B. C., is rebuilding its mill, burned a few weeks ago. The new plant will have a capacity of 200,000 ft. a day.

The ratepayers of West Vancouver, B. C., have passed a

by-law to install a waterworks system at a cost of $150,000. The work will start in the spring. H. McPherson is the engineer.

W. H. Hatch, of the Ingram-Hatch Motor Corporation, 2 Stone street, New York City, has announced that it plans building a plant at Calgary, Alberta, for the manufacture of automobiles and motor trucks operated by oil engines.

The Western Drydock & Shipbuilding Company, Port Arthur, Ont., has announced that it is going to build a $25,000 addition to its plant. James Whalen is in charge. Besides the finest class of interior woodwork, it will manufacture boilers and engines, clamshell buckets, structural iron and steel, etc.

Gilbert Hunt, Walla Walla, Wash., head of the Dominion Harvester Company, who is erecting a plant at Medicine Hat, Alberta, for the manufacture of threshing machines, is making arrangements for the carrying on of its business in the Alberta Foundry Company's plant, where it will manufacture for the winter to carry out a portion of its contracts. The new plant will be finished next spring.

The Mackie Mill & Mercantile Company, Gettysburg, Wash., will erect a shingle mill at New Westminster, B. C., with a capacity of 200,000 shingles per day.

Kamloops, B. C., will make extensions to its waterworks plant to cost $35,000 and to its electrical plant to cost $40,000. J. J. Carment is city clerk and C. North is department superintendent.

Extensions will be made to the plant of the Winnipeg, Man., municipal hospital, including pumps, valves, fans, etc. W. P. Brerton, 223 James avenue, is the engineer.

The Taylor Engineering Company, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $50,000 to manufacture machinery, etc.

Cochrane, Alberta, will install a waterworks system next year. J. E. Laird is secretary.

Eastern Canada

TORONTO, ONT., December 28, 1914.

The Electrical Truck Mfg. Company, Chatham, Ont., will erect a plant for the manufacture of motor trucks, etc.

The Canadian Pacific Railway will soon order two 20-knot steamers for transatlantic service.

The Everlasting Caskets & Vaults, Ltd., Chatham, Ont., will rent a factory and will need equipment, including drills, lathes, dies, presses, etc. W. G. Burrows and W. W. Burrows are among the principal stockholders.

Wells & Higman Co., Traverse City, Mich., has purchased 32 acres of timber land in Ontario, and will erect a shingle mill, a sawmill and veneer plants.

The drying plant and engine room of H. W. Cooper, 67 York street, Hamilton, Ont., was destroyed by fire with a loss of $10,000.

The board of control, Toronto, will purchase a lathe to cost about $500 for use in the asphalt plant. R. C. Harris is commissioner of works.

Large orders for machinery will be placed by the A. B. See Electric Elevator Company of Canada, Montreal, as part of the equipment for its elevator factory.

The mill of the Horne Brothers Milling Company, William and Bond streets, Lindsay, Ont., was destroyed by fire with a loss of $100,000. The machinery is a total loss. It is announced that the mill will be rebuilt.

Considerable progress has been made by the Canadian Electrical Association in its plans for the co-operative purchasing of supplies. It is expected that tenders will be called early in January for purchases running into a very large sum. The secretary-treasurer, Alan Sullivan, Toronto, announces that about 50 electric light companies in Canada have joined the organization, and that they hope to achieve considerable gain by their action. It is expected that not only will the co-operation result in the standardizing of supplies but that it will lower the cost of maintenance and thus benefit consumers.

The Dominion Stamping Company, Ford, Ont., will move its plant within the next six months on account of the noise caused by the heavy hammers, etc.

Hull, Que., will install an 8,000,000-gal. turbine pump at the waterworks plant and will make extensions to cost $200,000. J. P. A. Laforest is city engineer.

The Canadian Roofing Mfg. Company, Windsor, Ont., has been incorporated with a capital stock of $100,000 by J. H. Brown, A. R. Bartlet, Andrew Braid, and others.

The Star Boiler & Radiator Company, Ltd., Montreal, has been incorporated with a capital stock of $200,000 by Ulric Granger, Edouard Michaud, Charles Paquette, and others.

The Kaufman Rubber Company, Ltd., Berlin, Ont., is in the market for a 250-volt or 500-volt direct current motor or generator of 150 to 300 hp.

Government Purchases

WASHINGTON, D. C., December 28, 1914.

Sealed proposals will be received by the lighthouse inspector, Baltimore, Md., until 2 p.m. January 4 for furnishing two direct-connected or geared oil-engine driven air compressors and accessories.

The U. S. Reclamation Service, Washington, will receive sealed proposals until 2 p.m. January 6 for furnishing one 44-ton hoist for 60-ft. roller for the Grand River dam, Grand Valley project, Colo.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, December 22, for supplies for the navy yards, as follows:

Schedule 7584, Steam Engineering

Class 11, Puget Sound—One cold saw—Bid 78, $777.20; 158, $675, $843, and $1023; 183, $1411 and $1467; 191, $903; 224, $450; 275, $913.

Alternate—Same, f.o.b. works—Bid 78, $690.55 and $689.60; 158, $632, $794, and $972; 173, $755; 183, $1411 and $1467; 185, $745; 191, $878; 224, $450; 275, $828.

Schedule 7622, Construction and Repair

Class 61, Mare Island—One induction motor—Bid 89, $800; 93, $997; 292, $1311.

Alternate—Same, f.o.b. works—Bid 11, $900, informal; 93, $916; 292, $1201.

Schedule 7633, Construction and Repair

Class 91, Philadelphia—One double punch and shear—Bid 20, $1905, informal; 21, $1565 and $1790; 46, $1775; 115, $1746, $1763, $1920, and $1990; 117, $1800, informal; 137, $1793; 158, $2007, $2107, $1945, $1900, and $1890; 185, $1725, $1866, $1955, $1800, $1785, $1890 and $1830; 191, $2815; 211, $1713 and $1813; 256, $1670; 290, $1974, informal.

Schedule 7635, Steam Engineering

Class 102, Norfolk—One power press—Bid 24, $2480; 85, $2240; 158, $2103 and $2008; 185, $2485, $2465, and $2245; 211, $2275; 243, $1700, informal and $1925, informal; 255, $1980, informal; 268, $1991; 300, $2118.

Class 103, Norfolk—One beading machine—Bid 85, $850 and $755; 144, $427; 158, $416 and $410; 211, $843, $843.50, and $738.50; 255, $480, informal, and $490, informal.

Class 104, Norfolk—One bottom flanging machine—Bid 158, $500 and $494; 255, $585, informal, and $595, informal.

Class 105, Norfolk—One circle and slitting shears—Bid 84, $1222; 144, $963; 158, $1374; 255, $1454, informal, and $1544, informal.

Class 106, Norfolk—One power-forming press—Bid 117, $947.50, informal; 158, $614; 185, $908; 196, $900.66, informal; 255, $610 and $620.

Class 107, Norfolk—One spacing punch. Bid 158, $541; 185, $690.

Class 108, Norfolk—One power squaring shears—Bid 21, $656; 84, $639.60; 117, $773, informal; 144, $810; 158, $644; 185, $630 and $775; 196, $795, informal; 255, $685 and $705; 268, $1100.

The following bids were received by the light-house inspector, seventeenth district, Portland, Ore., November 21, for furnishing a combined engine and compressor unit with silent chain transmission for Robinson Point light-station, Wash.:

Bid 77, $3783; 89, $1933.50; alternate, $2074.50 for substituting herringbone gear for silent transmission; 159, $1594.

The names of the bidders and the numbers under which they are designated in the above lists, are as follows:

Bid 11, Allis Chalmers Mfg. Company; 20, Buffalo Forge Company; 21, Bertsch & Co.; 24, E. W. Bliss Company; 46, Cleveland Punch & Shear Works; 77, De La Vergne Machine Company; 78, Earle Gear & Machine Company; 84, Walter H. Foster Company; 85, Frevert Machinery Company; 89, Fairbanks, Morse & Co.; 93, General Electric Company; 115, Hilles & Jones; 117, Huntington Machine & Foundry Company; 137, Jackson & Church Company; 144, Kemp Machinery Company; 158, Manning, Maxwell & Moore; 159, A. H. McCay; 173, J. J. McGrath; 183, Newton Machine Tool Works; 185, D. Nast Machinery Company; 191, Niles-Bement-Pond Company; 196, George A. Ohl Company; 211, Prentiss Tool & Supply Company; 224, Joseph T. Ryerson & Son; 243, Standard Machinery Company; 255, D. H. Stoll Company; 256, Sculley Steel & Iron Company; 268, Toledo Machine & Tool Company; 275, VanDyke-Churchill Company; 290, Wickes Brothers; 292, Westinghouse Electric & Mfg. Company; 300, Cleveland Machine & Mfg. Company.

Annual Review Number

Some Features of The Iron Age of January 7, 1915.

¶ The great bulk of the first-of-the-year issue of The Iron Age is almost a tradition in the iron and steel and machinery trades. Last year's weighed 3 pounds 10 ounces.

¶ So many pages make an impressive showing; but they also make it necessary to emphasize certain articles, lest in the abundance of excellent material something may be overlooked.

More than a score of Feature Articles are scheduled—among them these:

¶ That from which the issue takes its name comes first—an interpretative review of 1914 in the American iron trade. Twenty-five pages of statistics and comment, and with them The Iron Age's much-sought charts showing fluctuations in iron and steel and metal prices in the seventeen years, 1898-1914.

¶ A full record of additions to iron and steel capacity in 1914, with facts about new construction completed or now under way.

¶ Progress in the Metallurgy of Iron and Steel in 1914 comprehensively reviewed by J. E. Johnson, Jr.

¶ A well told story by Prof. E. P. Lesley, Leland Stanford University, on the planning, construction and equipment of the Panama-Pacific Exposition.

¶ The record of a year's operation under the Ford Motor Company's profit-sharing plan (described in The Iron Age last January) is so remarkable as almost to require the editors to say in advance that it is a plain unvarnished statement of fact. All The Iron Age's articles on the Ford plant have evoked widespread commendation. The one to appear January 7 is the climax of the series.

¶ Construction of metal working shops is well represented in the Review Number by suggestive articles dealing with plants in St. Louis, Mo.; Toledo, Ohio; East Boston, Mass., and New Britain, Conn. One of these was built on a guaranteed basis of cost per square foot.

¶ Of timely interest is an article on the machining of shrapnel as practiced by a builder of engine lathes.

¶ Management is represented in a group of articles, one dealing with the application of scientific methods to the work of the office force. A purchasing system is described as used for scattered factories of a single company. Storeroom management is the subject of a third article.

¶ Some details of the duplex system of steel making that have not been published, in spite of the number of papers the engineering societies have had on this subject. The Iron and Steel Section will also have a description of an Ohio sheet-bar mill that is unique in many particulars, and Edwin C. Eckel will discuss sources of iron ore supply for a New York harbor iron and steel works.

¶ The Reed-Prentice Company's bonus system for machine shop and foundry is given with considerable detail. The result has been an important saving on a year's operations in a dull time.

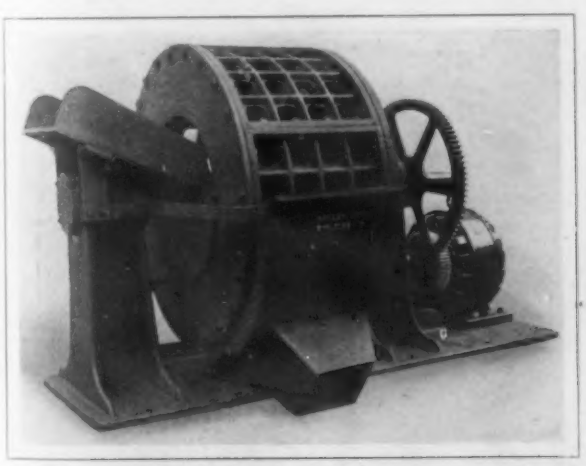
New Form of Foundry Tumbling Barrel

A marked reduction in the cost of breaking up the gates and sprues from malleable iron castings is claimed for a new tumbling barrel that has been placed on the market by Kane & Roach, Syracuse, N. Y. In addition to breaking these parts, the barrel, it is pointed out, also removes all the dirt and sand so that the output of the machine is ready for packing in the furnaces. The rate of production of this machine is from 15 to 20 tons in from 4 to 5 hr. The barrel, which is about 8½ ft. long and 5½ ft. high, is equipped with roller bearings.

In the accompanying illustration the machine is shown with the revolving drum exposed at the top to give some idea of its construction. Ordinarily the covering extends entirely around the machine, an arrangement which is relied upon to prevent dust and dirt from escaping, as well as keeping the pieces that have been broken up from flying out. The drum is about 4 ft. in diameter and 2 ft. long on the inside and is made up of six sections, all of which are interchangeable, so that it is possible to remove sections and replace them with others without much trouble. It is pointed out that these sections will fit and that the holes always match.

In operation the gates and sprues are placed in the hopper at one end. The machine is set in a pit, so that the top of the discharge spout is level with the ground. In this way the sprues can be conveyed or wheeled to the hopper and pushed through it into the revolving drum, where three or four iron balls impelled by the rotation of the drum fall on the gates and break them into pieces ranging from 1 to 4 in. in length. These pieces fall out through the holes in the side of the drum and are discharged through a spout to a conveyor for removal to the point at which they are to be used.

Although the machine is shown connected by gears to an electric motor, the arrangement which is recommended by the builder is to locate the motor



A New Form of Tumbling Barrel Designed Especially for Use in Malleable-Iron Foundries to Break Up Gates and Sprues

in an inclosed room or box some little distance from the barrel and transmit power through a belt connection. This arrangement, it is pointed out, keeps the motor out of the dust and dirt.

Advantages to be derived from the storage of coal under water have been the subject of tests by the Bureau of Engineers of the United States Navy. Admiral R. S. Griffen, chief of this bureau, in his annual report, states that the tests have been conducted for three years without so far developing any marked difference in value between coal in the open, under cover and under water.

A Grinding Attachment for Die Chasers

To meet the requirements of users of thread cutting dies, the Landis Machine Company, Waynesboro, Pa., has developed a grinding attachment for chasers. This attachment is intended particularly

An Attachment Developed for Use in Connection with Grinding Machines for Sharpening the Chasers of Thread Cutting Dies

for use in connection with a duplex grinding machine. In addition to making use of the chaser grinding attachment, the machine is also fitted with one for sharpening the disk cutters of roller pipe cutting machines, as well as grinding lathe and planing and shaping machine tools, etc. The machine is intended for use in the toolroom, and the special features claimed for it are rigid construction, guarded wheels and ease of operation, together with universal adaptability.

The grinding attachment for the die chasers is adjustable in both the horizontal and vertical planes and has graduations to control the lead and rake angles of the manufacturer's dies. Transverse and longitudinal feeds in the horizontal plane are provided, a feature which is relied upon to insure accurate grinding. The table is gibbed at both slides and has an overhang to protect the guides from emery dust.

The attachment for grinding the disk cutters is operated by hand and is also capable of adjustment both vertically and horizontally. An adjustable rest is provided to facilitate the handling of miscellaneous tools.

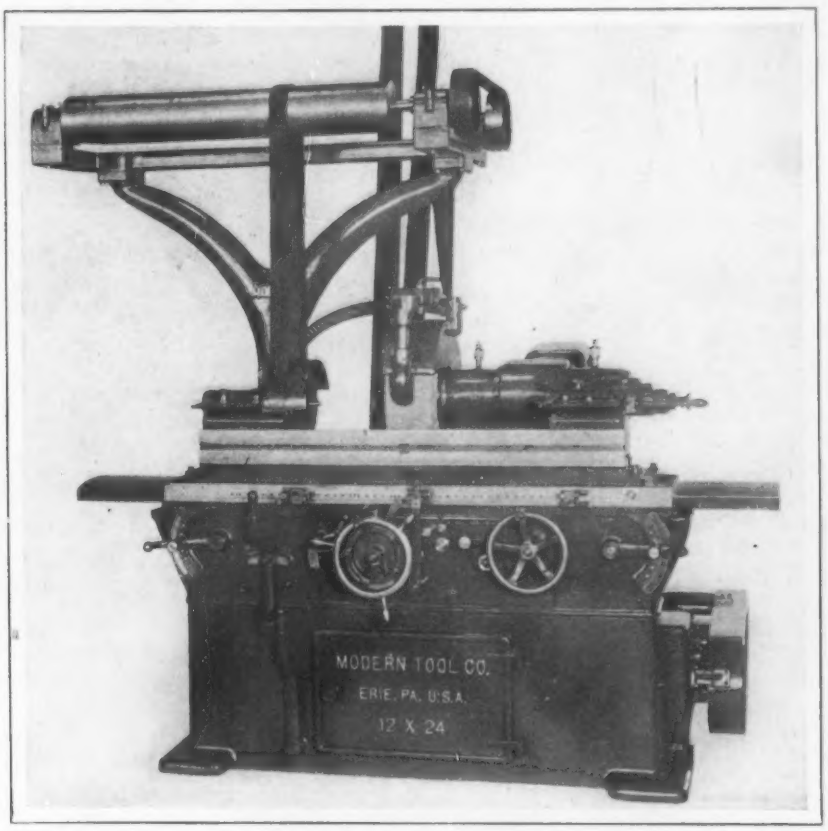
Reinforced Concrete Factory Buildings

In a paper presented by F. W. Dean, mill engineer and architect, Boston, Mass., at a recent meeting of the American Society of Mechanical Engineers, the advantages of the use of reinforced concrete for the construction of factory buildings, such as fire resisting qualities, great window area and good lighting are brought out as well as some of the disadvantages. The best methods of finishing the floors are discussed, as well as the application of wood as a wearing floor above the concrete. The difficulties of fastening hangers for shafting and machinery are pointed out, as well as the extra cost of drafting in consequence of this, and the great care required for making provision for everything to be installed. A discussion of the different methods of constructing floors and the various forms of ceilings is presented together with data on the relative cost of concrete and regular mill construction buildings.

HEAVY GRINDING MACHINE

Use of a Special Gear Box With a Ball Clutch to Vary Speeds and Feeds

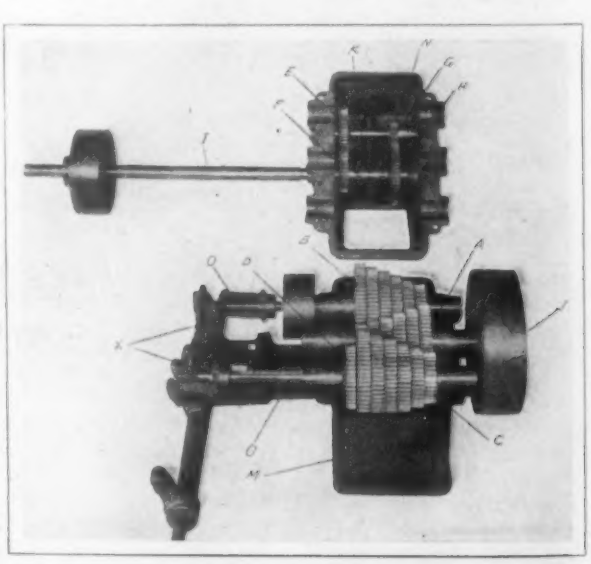
A series of self-contained grinding machines has been added to the line built by the Modern Tool Company, Erie, Pa. The series is built for two sizes of swing, 12 and 16 in., and in four lengths for mounting work measuring 2, 3, 4 and 5 ft. between centers. The particular features of the machine are the use of a single unit change gear mechanism to secure changes in work speeds and table feeds, the making of the automatic cross feed entirely independent of the reversing mechanism and the use of a special attachment for grinding short work.



Front View of a Recently Developed Self-Contained Grinding Machine

The machine is of heavy, rigid construction throughout, and the power is supplied by a single belt from the lineshaft or a direct motor connection. The head and foot stocks are mounted on V and flat ways, which is relied upon to permit perfect alignment in all positions. This construction is also used in mounting the wheel stand on the base. Belt drive is employed for the headstock entirely. The standard wheel equipment for all sizes of machines is 18 in. in diameter, with a 2-in. face, although any width up to 6 in. can be used. Work up to 24 in. in diameter can be handled on the machines having a 12-in. swing, while 30 in. is the maximum diameter for the 16-in. size. It is pointed out that the construction of the machine will permit grinding of the work to its maximum capacity with a full-sized wheel, and the diameter of the wheel can be reduced to 9 in. before it is necessary to discard it. The wheel spindle is 3¼ in. in diameter, with bearings 8¼ in. long. A pulley 7 in. in diameter is mounted on the spindle and receives its power through a 6-in. belt from a two-step cone pulley, the step diameters being 13 and 19 in. respectively.

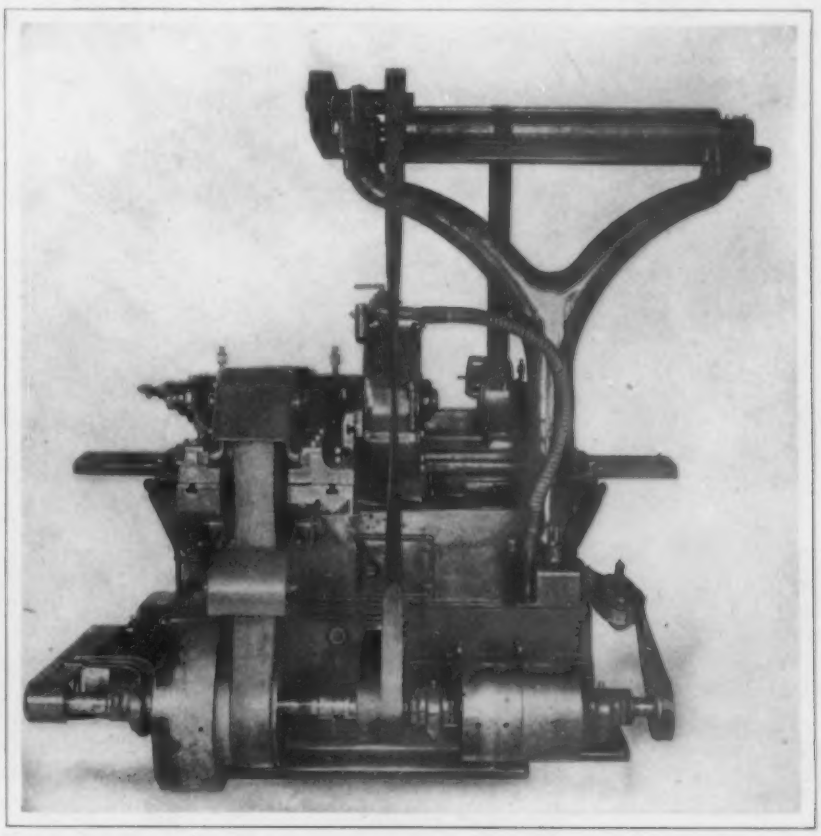
Probably the most important feature of the machine is the use of a single unit change-speed mechanism with a ball-drive clutch, to give 12 work speeds and 6 table feeds, through the operation of a lever on the front of the machine. Referring to the illustration of the gear box, it will be noticed that this mechanism consists of three sets of gears, A, B and C, running in oil, at a constant speed and always in mesh. The gears B and C are mounted on a sleeve, which is pinned to the shaft O, and there is a hardened ball race in the hub of each of these gears. A steel ball is located centrally with the hub of each gear within the sleeve and is moved outward in the hole T by a sliding key until it engages the gear desired. The central series of gears A are the drivers, receiving their power from the pulley J, which in turn is driven from the main driving shaft at the rear of the machine at a constant speed. Through the series B six different table feeds are obtained, each of which is independent of the other. The work speeds are controlled by the series C, and the six different changes obtained directly through the gears are doubled by the introduction of the independent gear D in connection with shafts and gears in the upper gear box. In the upper section the gears E and G are mounted solidly on their shafts, while F and H are mounted loosely, the clutch K being keyed to the shaft I. The gears D and E mesh and by shifting the clutch K to bring F and H into mesh, 12 speeds are provided for the shaft I, which governs the speed of the work. The gears are brought into positive action and locked with the driven shaft O individually by the ball in the sleeve being forced into the pocket in the hub of any gear in the set B or C, by a sliding key which is operated through the shaft O. In this way it is pointed out that it is possible to change from the highest to the lowest speed or to any intermediate one without stopping



Interior View of the Gear Box Showing the Arrangement of Gears Employed to Secure the Work Speeds and Table Feeds

the machine or the work. A dial indicating the various changes is provided in conjunction with the speed levers on the front of the machine.

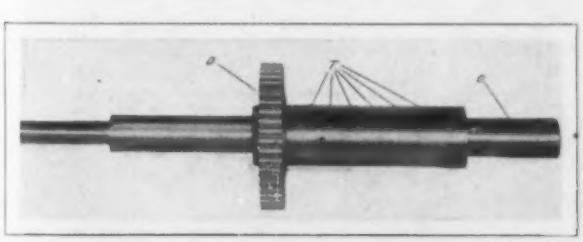
The automatic cross feed is entirely independent of the reversing mechanism and operates by the reversal of the table, either at one or both ends of the stroke, as may be desired. The maximum possible feed is 0.0050 in., while the minimum is 0.0005 in. An automatic throw-out and positive stop are provided. For grinding short work it is possible to supply a special attachment which makes it possible to feed straight in automatically with the table stationary.



Rear View of the Machine Which Is Designed to Use a Large Diameter Wide Face Wheel

Harmony Club of the Osborn Company

The J. M. & L. A. Osborn Company, Cleveland, Ohio, has a considerable number of its employees holding responsible positions. These employees have formed an organization known as the Harmony Club, the purpose of which is to promote the working interest and welfare of the company and its employees and to encourage the faithful performance of all duties by officers and employees. The second annual meeting of this organization was held this week. The programme included a meeting on Monday afternoon, at which reports of committees were made; in the evening the members and their ladies participated in a dinner at the Hotel Statler; on Tuesday afternoon J. W. Lucas, manager of sales, presented a series of selling problems and the usual business was transacted; in the evening the members participated in a dinner at the Chamber of Commerce and were addressed by George P. Early, Pittsburgh, on "Claims and Their Adjustment"; on Wednesday afternoon a discussion of selling arguments on Osborn's Guaranteed Old Style tin plate claimed the attention of the meeting; in the evening the members participated in a dinner at Schuster's, after which officers were elected for the coming year.



The Ball Clutch Drive Construction Used in the Gear Box

A 20 per cent. increase in factory payrolls in 60 days is reported by the Merchants' & Manufacturers' Association of Racine, Wis., which is making periodic surveys. On October 15 the number of unemployed was 50 per cent. of the total normal payroll, while on December 15 the number had been reduced to 30 per cent. By January 1 it is expected that a further reduction of 10 to 15 per cent. will have been effected.

The extensions that are being made to the Trumbull Steel Company's plant, Warren, Ohio, about doubling the capacity of the plant, are nearing completion and it is stated that the new mills will probably be started not later than February 1.

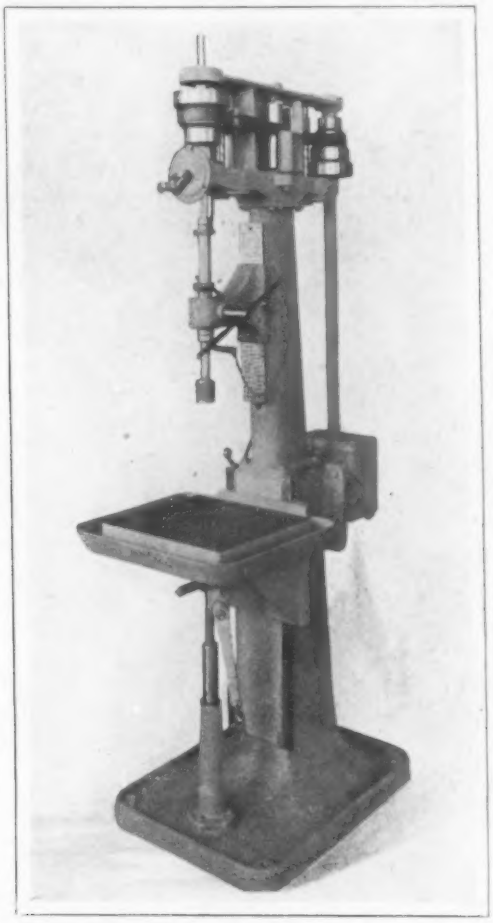
Floor Surfaces in Fireproof Buildings

At a recent meeting of the American Society of Mechanical Engineers, Sanford E. Thompson, consulting engineer, Boston, Mass., presented a paper in which the different kinds of floor surfaces are discussed briefly and their various qualities, cost and adaptability to specific conditions compared. As ordinarily laid in buildings granolithic or concrete surfaces are subject to dusting and under heavy traffic, such as trucking, are liable to serious wear. On the other hand, it has been the author's experience that with first-class construction it is possible, by proper selection of the aggregates and expert workmanship, to reduce the dusting to an insignificant amount and to produce a surface hard enough to stand severe wear. This is also borne out by tests of actual floors. Although there have been many cases of inferior construction, the use of granolithic for factory floors is largely increasing, and it is becoming recognized that the durability of this floor is dependent in a very large measure upon the sand or other ingredients used in the construction and the method of laying it.

A pleasing surface approaching terrazzo in appearance and fully as durable under foot traffic can be obtained by placing granolithic with scarcely any troweling and then grinding the surface sufficiently to expose the grains of sand and stone. It is stated that the grains which show are finer than terrazzo and darker colored. A glassy effect can be produced if desired by the grinding, which permits of easy cleaning and gives a surface suitable even for a lavatory at much less cost than tile or terrazzo. As a result of laboratory experiments and the construction of test floors, the author has found that for a granolithic floor to give satisfactory service, the aggregate should contain no dust, but should consist chiefly of particles ranging from 1/16 to ½ in. in size, the proportions being one part cement and two parts of aggregate. The mixture should have such a consistency that it will not flow but will hold its shape in a pile without settling. Troweling should be thorough but no excess water should be brought to the surface, a hard, dense surface rather than a smooth, glassy one being the result sought.

Quick Change Sensitive Drilling Machine

A sensitive drilling machine in which all the speed changes to enable drills of different sizes to be driven at the proper cutting speeds and one size of drill substituted for another without stopping the machine has been developed by the Sipp Machine



A Sensitive Drilling Machine Having a Special Speed Changing Arrangement

Company, Erie Railroad, Keen and Warren streets, Paterson, N. J. It is pointed out that in this machine it is unnecessary for the operator to leave his natural working position to change speeds or drills, raise or lower the table or throw the power on or off. Another feature about the machine is that the driving belt, which is of the endless type tracks without twists or turns and the slack and stretch are automatically taken care of.

The table is of rigid construction reinforced by ribbing, with an oil groove extending entirely around it. The telescopic elevating screw is relied upon to give extra support under the pressure of the drill as well as avoiding the boring of a hole in the floor. The table is locked rigidly to the base by a gib and the crank handle controlling the elevation of the table is placed to the right of the operator, thus enabling him to adjust the hight of the table without leaving his natural working position.

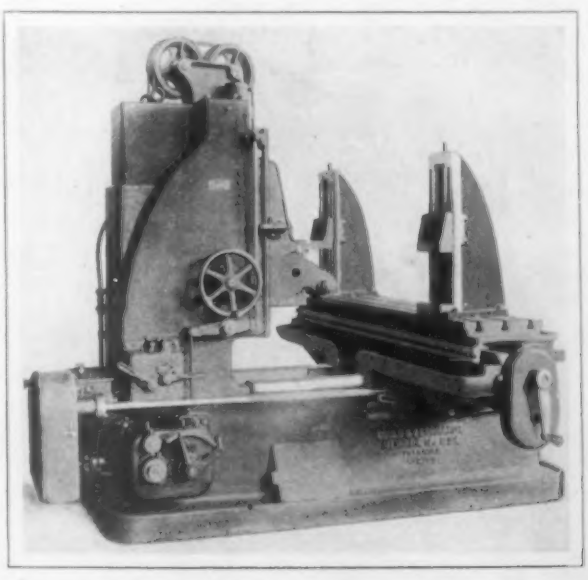
The machine has four speed changes, arranged for either carbon or high-speed drills. A dial showing the number of revolutions per minute is attached to the head in plain sight of the operator, who simply has to swing the lever to the desired speed. These machines will handle all sizes of high-speed drills, from the smallest up to 29/32 in. in diameter. The spindle is finished by grinding and has a ball thrust bearing. A stop collar is provided so that holes of a given depth can be duplicated accurately.

The machine is driven by an endless belt which runs over two idlers. One of these is fixed and the other which is held in the swinging arm of the machine is forced by a light spring against the slack side of the belt. This pressure, it is pointed out, is sufficient to make the belt pull efficiently under the resistance of the work being drilled and also take up any stretch that develops in the belt through continued use automatically. The cone pulley driving the spindle runs on ball bearings which, it is pointed out, take all the strain off the belt.

A New Style of Rack Cutting Machine

A rack cutting machine which is a combination of its vertical gear cutting machine with a rectangular work table has been placed on the market by Gould & Eberhardt, Newark, N. J. This machine is an automatic rack cutting machine, having a capacity for racks 60 in. long, with a 10-in. face and maximum diametral pitches of 1½ in cast iron and 2 in steel. Another feature of the machine is the providing of an extra auxiliary cutter spindle. In addition to the cutting of racks, it is also possible to convert the machine to the builder's standard 16 x 60-in. spur gear cutting machine by removing the rectangular work table and the extra auxiliary cutter spindle and substituting the regular circular work table and carriage. All of the movements of the machine are automatic, the work table indexing automatically, and while this operation is being performed the cutter slide is locked so that it cannot feed down until the indexing is completed. Either single or gang cutters can be used, and the machine will index automatically for the number of cutters being used at one time. In the accompanying illustration two vises are shown mounted on the table. This equipment is not furnished regularly with the machine, but serves to illustrate how several racks can be mounted one on top of the other.

The work table indexing screw is provided with a micrometer, so that the table, together with the rack which is being cut, can be moved slightly without disturbing the change gears controlling the indexing. This makes it possible to cut racks longer than the rated capacity of the machine, 60 in., or sections of racks that are to be matched together to form a single long piece. A compact feed gear box provides 16 feed changes, and there is a wide range of cutter speeds.



An Automatic Machine for Cutting Racks Up to 60 In. in Length and 10 In. Wide Which Can Be Readily Converted Into a Standard Spur Gear Cutting Machine

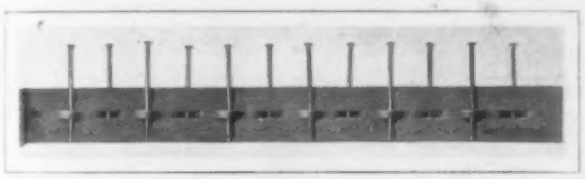
The machine is driven by a single belt, and the driving pulley is completely inclosed by a guard. All the running gears are also protected to guard against accidents.

If desired, the machine can be furnished with an indexing table for cutting either spur gears or spur and bevel gears. In this way the machine can be used in plants where the amount of rack cutting to be done is not sufficient to keep it busy. This feature, it is pointed out, makes the machine available for plants manufacturing a general line of gears or for firms doing gear jobbing work as the change from a rack cutting to a gear cutting machine or vice versa can be made in a short space of time.

New Type of Foundry Flask Bar

A new type of foundry flask bar has been brought out by the Hill Clutch Company, Cleveland, Ohio. The bar was developed in the company's machine shop for use in its own foundry, and proving more satisfactory than the wooden flask bar and other types that had been used, it was decided to place it on the market. It is made from a steel bar 3 in. wide and 3/16 in. thick and is fitted with No. 3 gauge 50-lb. barbed car nails 5½ in. long. The bar is punched as shown and the nails fit so snugly that the pattern cope can be raised by hooking a crane to the head of one of the nails.

The bar is said to be particularly well adapted for gravity and all other types of molding machines, as well as floor flasks, and particularly where there is considerable duplication of work.



A New Form of Punched Steel Foundry Flask Bar Employing Nails as Gaggers

It is made in stock lengths or cut to special lengths with ends flanged and drilled to fit the size of flask specified. If desired it can also be furnished without the flanges.

The Crosby Company, Pratt and William streets, Buffalo, N. Y., has been successful in its experiments in the manufacture of shrapnel shells on its stamping machines. These shells are about 14 in. in length and 2 in. in diameter and are drawn from brass sheets. Hitherto such shells have been made by hydraulic pressure, which is a slow process, while the shells made by the Crosby Company much faster are an exact reproduction as to flange, taper and thickness of metal. Experts have declared that a stamping of this kind was not a possibility, but the engineers of the company have shown their ability to do it and meet every specification and every test demanded. It is expected that the company will receive important foreign contracts and probably a contract from the United States Government for these shells, which can be turned out rapidly.

The Racine Carriage Company, Racine, Wis., organized a short time ago with $25,000 capital, is consolidating the vehicle interests of the Richardson-Kennedy Company and the Racine plant of the Racine-Sattley Company. The president is W. H. Richardson; vice-president, J. O. Kennedy; secretary and treasurer, J. C. Lund. The plant formerly occupied by the Racine Carriage & Wagon Company has been leased for a long term and a large production of high-grade vehicles and wagons is to be undertaken at once.

New Universal Internal Grinding Device

The Standard Electric Tool Company, Cincinnati, Ohio, has designed a new internal grinding device for smoothing up the interior of gasoline engine cylinders, air cylinders, etc. The device is intended to be inserted in the tool post of a lathe,

A New Universal Motor-Driven Grinding Device for Finishing the Interiors of Cylinders of All Kinds and Similar Work

this arrangement being relied upon to insure rigidity. The power required for operation can be taken from the nearest electric light socket or a connection can be made with a power circuit if that is found more desirable.

The emery wheel used is 3½ in. in diameter with a 1-in. face. Ball bearings are used throughout the device, the double roll S. K. F. type being employed. The armature shaft is supported by three ball bearings which it is emphasized keep the shaft rigid and prevent chattering of the emery wheel.

A ½-hp. motor is used for driving the wheel and will operate on either direct current or on alternating-current circuits where the frequency is as low as 25, 30 or 40 cycles. The speed of the motor is 7000 r.p.m., which gives a surface speed of the emery wheel of approximately 6000 ft. per min. The tool weighs 35 lb.

Methods for Local Case Hardening

The local case-hardening of steel objects was recently discussed by Messrs. Guillet and Bernard in a paper before the Société d'Encouragement pour l'Industrie National of France. The methods employed were summarized as follows:

1. The parts to be protected against cementation are covered with fire clay. The protection thus furnished is not complete, as the gases penetrate the fire clay. Also in complex shapes the method becomes complicated and expensive.

2. A tube is shrunk over the parts to remain uncemented, the thickness of the tube being slightly greater than the depth of case required. After the end of the cementing process the tube is broken off. This method is obviously very limited in its application.

3. The object is made with extra thicknesses in those parts which must not be hardened. After cementation and before hardening, these extra thicknesses are machined off. This process is very expensive.

4. The parts not to be cemented are protected by a metallic deposit which must be (a) solid at the cementing temperature, (b) impervious to the cementing materials, (c) easily obtained commercially, and (d) easily removed after the operation. Copper and nickel are the only metals which fulfil conditions (a) and (c), and the latter fails to comply with condition (b).

The metal may be deposited by immersion in a salt solution, by electrolysis, or by the Schoop spraying process. The first-mentioned is not satisfactory owing to the thinness and uncertain adherence of the coating. The electrolytic process is cheaper to install than the spray process, which, on the other hand, is quicker and more easily localized.

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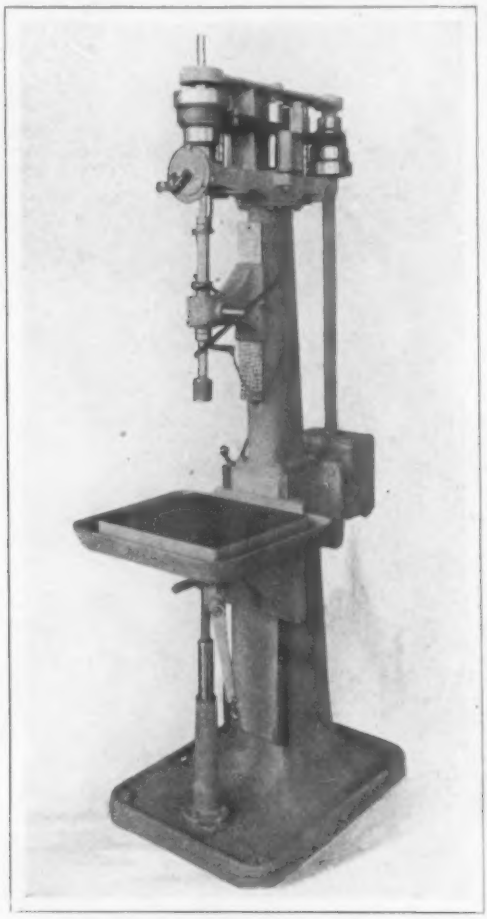

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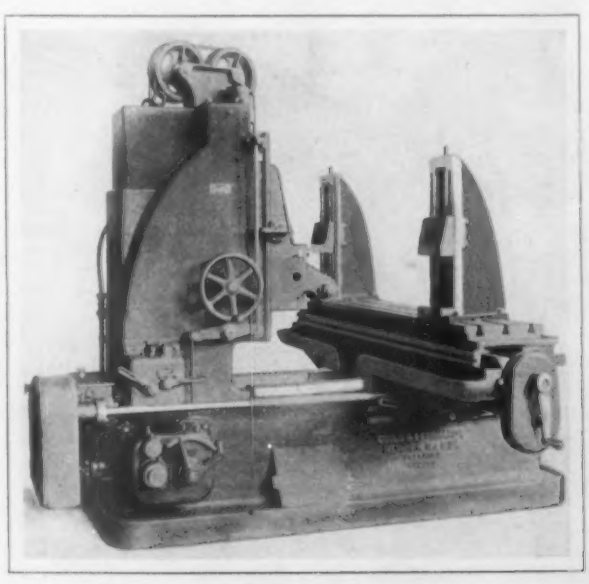
The machine is driven by an endless belt which runs over two idlers. One of these is fixed and the other which is held in the swinging arm of the machine is forced by a light spring against the slack side of the belt. This pressure, it is pointed out, is sufficient to make the belt pull efficiently under the resistance of the work being drilled and also take up any stretch that develops in the belt through continued use automatically. The cone pulley driving the spindle runs on ball bearings which, it is pointed out, take all the strain off the belt.

A New Style of Rack Cutting Machine

A rack cutting machine which is a combination of its vertical gear cutting machine with a rectangular work table has been placed on the market by Gould & Eberhardt, Newark, N. J. This machine is an automatic rack cutting machine, having a capacity for racks 60 in. long, with a 10-in. face and maximum diametral pitches of 1½ in cast iron and 2 in steel. Another feature of the machine is the providing of an extra auxiliary cutter spindle. In addition to the cutting of racks, it is also possible to convert the machine to the builder's standard 16 x 60-in. spur gear cutting machine by removing the rectangular work table and the extra auxiliary cutter spindle and substituting the regular circular work table and carriage. All of the movements of the machine are automatic, the work table indexing automatically, and while this operation is being performed the cutter slide is locked so that it cannot feed down until the indexing is completed. Either single or gang cutters can be used, and the machine will index automatically for the number of cutters being used at one time. In the accompanying illustration two vises are shown mounted on the table. This equipment is not furnished regularly with the machine, but serves to illustrate how several racks can be mounted one on top of the other.

The work table indexing screw is provided with a micrometer, so that the table, together with the rack which is being cut, can be moved slightly without disturbing the change gears controlling the indexing. This makes it possible to cut racks longer than the rated capacity of the machine, 60 in., or sections of racks that are to be matched together to form a single long piece. A compact feed gear box provides 16 feed changes, and there is a wide range of cutter speeds.



An Automatic Machine for Cutting Racks Up to 60 In. in Length and 10 In. Wide Which Can Be Readily Converted Into a Standard Spur Gear Cutting Machine

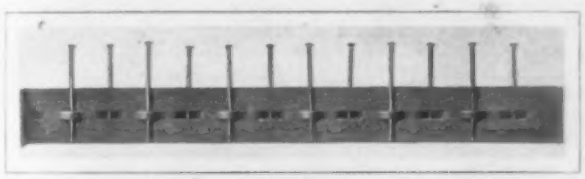
The machine is driven by a single belt, and the driving pulley is completely inclosed by a guard. All the running gears are also protected to guard against accidents.

If desired, the machine can be furnished with an indexing table for cutting either spur gears or spur and bevel gears. In this way the machine can be used in plants where the amount of rack cutting to be done is not sufficient to keep it busy. This feature, it is pointed out, makes the machine available for plants manufacturing a general line of gears or for firms doing gear jobbing work as the change from a rack cutting to a gear cutting machine or vice versa can be made in a short space of time.

New Type of Foundry Flask Bar

A new type of foundry flask bar has been brought out by the Hill Clutch Company, Cleveland, Ohio. The bar was developed in the company's machine shop for use in its own foundry, and proving more satisfactory than the wooden flask bar and other types that had been used, it was decided to place it on the market. It is made from a steel bar 3 in. wide and 3/16 in. thick and is fitted with No. 3 gauge 50-lb. barbed car nails 5½ in. long. The bar is punched as shown and the nails fit so snugly that the pattern cope can be raised by hooking a crane to the head of one of the nails.

The bar is said to be particularly well adapted for gravity and all other types of molding machines, as well as floor flasks, and particularly where there is considerable duplication of work.



A New Form of Punched Steel Foundry Flask Bar Employing Nails as Gaggers

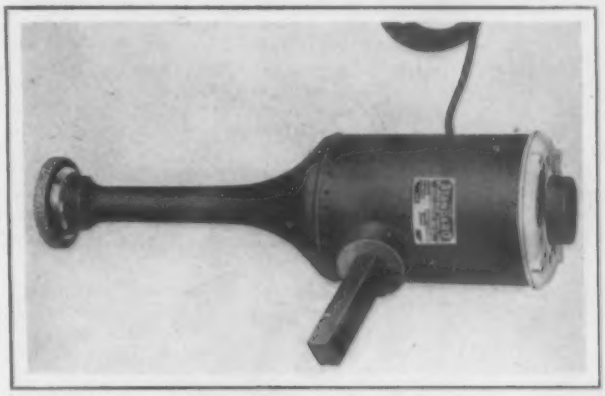
It is made in stock lengths or cut to special lengths with ends flanged and drilled to fit the size of flask specified. If desired it can also be furnished without the flanges.

The Crosby Company, Pratt and William streets, Buffalo, N. Y., has been successful in its experiments in the manufacture of shrapnel shells on its stamping machines. These shells are about 14 in. in length and 2 in. in diameter and are drawn from brass sheets. Hitherto such shells have been made by hydraulic pressure, which is a slow process, while the shells made by the Crosby Company much faster are an exact reproduction as to flange, taper and thickness of metal. Experts have declared that a stamping of this kind was not a possibility, but the engineers of the company have shown their ability to do it and meet every specification and every test demanded. It is expected that the company will receive important foreign contracts and probably a contract from the United States Government for these shells, which can be turned out rapidly.

The Racine Carriage Company, Racine, Wis., organized a short time ago with $25,000 capital, is consolidating the vehicle interests of the Richardson-Kennedy Company and the Racine plant of the Racine-Sattley Company. The president is W. H. Richardson; vice-president, J. O. Kennedy; secretary and treasurer, J. C. Lund. The plant formerly occupied by the Racine Carriage & Wagon Company has been leased for a long term and a large production of high-grade vehicles and wagons is to be undertaken at once.

New Universal Internal Grinding Device

The Standard Electric Tool Company, Cincinnati, Ohio, has designed a new internal grinding device for smoothing up the interior of gasoline engine cylinders, air cylinders, etc. The device is intended to be inserted in the tool post of a lathe,



A New Universal Motor-Driven Grinding Device for Finishing the Interiors of Cylinders of All Kinds and Similar Work

this arrangement being relied upon to insure rigidity. The power required for operation can be taken from the nearest electric light socket or a connection can be made with a power circuit if that is found more desirable.

The emery wheel used is 3½ in. in diameter with a 1-in. face. Ball bearings are used throughout the device, the double roll S. K. F. type being employed. The armature shaft is supported by three ball bearings which it is emphasized keep the shaft rigid and prevent chattering of the emery wheel.

A ½-hp. motor is used for driving the wheel and will operate on either direct current or on alternating-current circuits where the frequency is as low as 25, 30 or 40 cycles. The speed of the motor is 7000 r.p.m., which gives a surface speed of the emery wheel of approximately 6000 ft. per min. The tool weighs 35 lb.

Methods for Local Case Hardening

The local case-hardening of steel objects was recently discussed by Messrs. Guillet and Bernard in a paper before the Société d'Encouragement pour l'Industrie National of France. The methods employed were summarized as follows:

1. The parts to be protected against cementation are covered with fire clay. The protection thus furnished is not complete, as the gases penetrate the fire clay. Also in complex shapes the method becomes complicated and expensive.

2. A tube is shrunk over the parts to remain uncemented, the thickness of the tube being slightly greater than the depth of case required. After the end of the cementing process the tube is broken off. This method is obviously very limited in its application.

3. The object is made with extra thicknesses in those parts which must not be hardened. After cementation and before hardening, these extra thicknesses are machined off. This process is very expensive.

4. The parts not to be cemented are protected by a metallic deposit which must be (a) solid at the cementing temperature, (b) impervious to the cementing materials, (c) easily obtained commercially, and (d) easily removed after the operation. Copper and nickel are the only metals which fulfil conditions (a) and (c), and the latter fails to comply with condition (b).

The metal may be deposited by immersion in a salt solution, by electrolysis, or by the Schoop spraying process. The first-mentioned is not satisfactory owing to the thinness and uncertain adherence of the coating. The electrolytic process is cheaper to install than the spray process, which, on the other hand, is quicker and more easily localized.

Trade Publications

Valve Tools.—American Valve Tool Company, Stamford, Conn. Folder. Treats of a line of valve tools which includes adjustable ones for facing and seating valves, the maximum capacity of the seating tool being 3 in. Illustrations of both tools are given, together with brief instructions for their use.

Asbestos Protected Metal.—Asbestos Protected Metal Company, Beaver Falls, Pa. Bulletin No. 54. Concerned with the use of asbestos protected metal for roofing and walls in connection with concrete. This type of construction, which is called Asbestosteel, makes use of ordinary sheet steel, to which a uniform coating of asphalt is applied on both sides. This in turn is protected by a layer of hardened and waterproof asbestos felt, which is laid over and imbedded in the asphalt while the latter is hot and soft. The properties of this material are briefly described, with a number of views of its application to roofs, walls, ceilings and coal bins. Views of a number of industrial plants in which this metal has been used are presented with tables of the safe loads that can be supported by it.

Calendar.—Whitman & Barnes Mfg. Company, Akron, Ohio. Calendar. The upper portion of the calendar contains an illustration of one of the Gatun Lock gates, on which, in common with the other 45 gates of the Canal, this company's twist drills and reamers were employed for drilling and reaming 28,650 holes. Mention is also made of the other lines of the company, such as wrenches, spring cotters and drop forgings. Each of the leaves of the calendar contains the dates for three months, and a calendar for 1915 and 1916 is given on the last leaf.

Wood Turning Machinery.—Lewis T. Kline, Alpena, Mich. Catalogue. Deals with a line of wood turning and wood working machines. Illustrations of the various lines which include machines for turning broom handles, spools and plugs; making excelsior, saws, grinding machines, baling presses, wood slitting and barking machines, etc., are presented together with brief descriptions. Illustrations of the parts of different machines are presented, together with views of some of the work that has been turned out by them.

Nuts and Bolts.—Upson Nut Company, Cleveland, Ohio. Catalogue. Size, 5¼ x 7½ in.; pages, 208. Covers a comprehensive line of nuts and bolts, including hot pressed, cold punched and semi-finished nuts and washers; machine, carriage, coach, plow, tire, spring, stove, stud, loom, elevator, track and miscellaneous bolts; axle clips and yokes, etc. Illustrations of the various lines are presented, together with tables of the sizes in which they can be furnished. A number of tables of weights and a complete telegraph code and index are included.

Calendar.—Johnston Harvester Company, Batavia, N. Y. Four leaf hanger. Each of the leaves in addition to containing the dates for three months, has a picture of seasonable interest, as well as an illustration of some portion of the line of farm machinery built by this company.

Heat Treating Furnaces.—Quigley Furnace & Foundry Company, 105 West Fortieth street, New York City. Bulletin No. 7. Illustrates a line of underfired heat treating furnaces, using gas or oil fuel. These furnaces are designed particularly for handling small material for annealing, hardening, tempering, galvanizing, forging, etc., where a uniform and controllable temperature is required. Views of the furnace in use are presented, together with exterior and sectional views, and a table giving the dimensions of the sizes regularly furnished is included.

Pulleys.—American Pulley Company, Philadelphia, Pa. Collection of loose leaf circulars. Bring out the various features of the construction and use of these pulleys. The text matter in the circulars is supplemented by a number of line and halftone engravings of the various parts. Numerous dimension tables and curves showing the results of tests are included.

Motor-Generator Sets.—Allis-Chalmers Mfg. Company, Milwaukee, Wis. Bulletin No. 1090. Shows a number of different sizes of motor-generator sets for converting alternating current to direct or vice versa. These sets are intended for use in steel plants, railway central stations, electrochemical plants and other locations where an intermittent load with high peaks has to be taken care of. For handling the last class of service, a set with a flywheel is used, the flywheel being designed to smooth out the inequalities in the load.

Lock Washers.—Positive Lock Washer Company, Avenue A and Miller street, Newark, N. J. Pamphlet. Lists the various sizes of positive and plain washers that can be supplied for use on automobiles, track joints and crossings, locomotive and car frames, trucks, electric motors, bridges and machinery. In connection with the lists of the sizes of bolts for which washers can be furnished, the width and thickness of material used for the washers is given. Lists of tail nut locks and washers made according to the S. A. E. standards are given. One of the special features of this washer is that it can be reversed and used a number of times. In the design of the washer the body carries the load of compression, thus relieving the tapered ends and giving a constant spring.

Automobile Axles and Springs.—Hess Spring & Axle Company, Carthage, Cincinnati, Ohio. Catalogue. Shows a number of different types of springs and axles for automobiles that have been turned out by the company. The axles are heat treated drop forgings with pressed steel housings, and views of the various differentials are presented together with illustrations of portions of the plant in which the work is turned out.

Electric Generators.—General Electric Company, Schenectady, N. Y. Two bulletins.—The first, No. 42,010, superseding No. 4887, illustrates and describes in considerable detail a line of horizontal turbo-generator sets, built in capacities ranging from 7 to 300 kw. for direct current and 100, 200 and 300 kw. for alternating current. The sets are used for supplying light and power in mills, machine shops, breweries, etc. The turbines can be furnished for either condensing or non-condensing operation for any steam pressure above 80 lb. The construction of the sets is gone into at some length, with illustrations of the various parts, and a number of views of installations are included. The second bulletin No. 42,300, superseding No. 4804, describes a line of small direct-connected steam engine driven generating sets ranging from 2½ to 75 kw. They can be used for power and lighting in isolated plants as well as for exciters for alternating-current generators. Both the engine and generator are described in considerable detail in the bulletin, and a number of illustrations of the various parts are included.

Lamp Guards.—Harvey Hubbell, Inc., Bridgeport, Conn. Folder. Describes and illustrates a line of wire incandescent lamp guards that are made in a number of different styles. Several of the guards are equipped with a lock to prevent the lamp from being stolen or exchanged and two styles have reflectors.

Vises and Pumps.—Fulton Machine & Vise Company, Lowville, N. Y. Catalogue. Supersedes all previous catalogues and contains illustrations and brief descriptions of a line of vises, centrifugal pumps of various sizes and styles arranged for belt, engine or motor drive and a line of paper makers' machinery such as core punches, slab and edging barking machines and a pulp stone truing lathe. The descriptions are brief and condensed specification tables are included.

Steel Plate Construction.—Treadwell Construction Company, Midland, Pa. Calendar. Size, 19 x 24½ in. The various lines of work handled by the company, which include blast furnaces, welded and riveted tanks, hot metal ladles, condensers, smoke stacks, steel cylinders, cooling towers, galvanized pans, riveted steel pipe, etc., are listed on each leaf. Views of some of the work done by this company, including one of the steel pipe for the Los Angeles Aqueduct, are given on the several leaves.

Iron Ore in the Philippines

A deposit of iron ore in Surigao province on the island of Mindanao, Philippine Islands, has been discovered by H. F. Cameron, department engineer for Mindanao and Sulu, according to the Philippine Journal of Science. The extent of the deposit appears to be large, covering an area of probably 40 sq. mi. The ore is a clayey red limonite with an iron content of 55 to 60 per cent., no sulphur or phosphorus, but traces of chromium. The area covering the deposit has been reserved from mineral location by the Government, until further facts as to the extent and value of the deposit can be obtained by surveys to be made by the Bureau of Science.

In the first 11 months of 1914 the sum of $1,059,788 was paid to workmen by Wisconsin employers under the workmen's compensation act or industrial insurance law, according to figures just made public by the Wisconsin Industrial Commission. The cost of administration for the period was approximately $15,000. In comparison, it is shown that, previous to the enactment of the law, Wisconsin employers paid out $600,000 in a similar period, but employees received only $150,000, the remaining $450,000 being paid for lawsuits and court fees.

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